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(54) **A HAIRDRYER AND A METHOD OF FUNCTIONING OF A HAIRDRYER**

HAARTROCKNER UND FUNKTIONSWEISE EINES HAARTROCKNERS

SÈCHE-CHEVEUX ET PROCÉDÉ DE FONCTIONNEMENT DE SÈCHE-CHEVEUX

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Description

[0001] The present invention relates to a hairdryer and to a method of functioning of such hairdryer, which allow to avoid damages to the user's hair due to excessively high temperature of the blown air.

[0002] Hairdryers are available in the market which are capable of monitoring the temperature of the user's hair being dried in order to avoid too high temperatures to be reached and hence to avoid the hair to be damaged.

[0003] The patent application n. US 4424437 A discloses for instance a hairdryer having a radiometer which remotely senses the infrared radiation emanating from the user's hair being dried and which contains a control means that causes the heating means in the dryer to turn off when the infrared radiation indicates the temperature of the hair is about 50 °C.

[0004] Another similar hairdryer is disclosed in the European patent n. EP 0672871 B1 and it comprises an infrared sensor which is wired to the heater controller. When a predetermined temperature is attained and sensed by the infrared sensor, the heating is reduced or discontinued.

[0005] Both the hairdryers disclosed in the above mentioned patent and patent application however have the main drawback not to allow the user to autonomously control the functioning of the hairdryer and hence not to allow the user to operate the hairdryer according to his/her specific needs.

[0006] The patent application JP 2013081642 A discloses a hairdryer with a switch for setting the air temperature mode of multiple steps.

[0007] The aim of the present invention is therefore to provide a hairdryer which allows the user to avoid damages to the hair being dried or styled while ensuring an optimal flexibility of use and efficiency.

[0008] A further aim of the present invention is to provide a hairdryer which is simple and safe to be used.

[0009] Another aim of the present invention is to provide a method of functioning of a hairdryer which is reliable and which allows the user to select autonomously the functioning parameters of the hairdryer during its use.

[0010] These aims have been achieved by the hairdryer as defined in claim 1 and by the method of functioning of the hairdryer as defined in claim 12. Further achievements have been attained by the subject-matters respectively defined in the dependent claims.

[0011] The hairdryer realized in order to attain the aim of the present invention, explicated in the first claim and the respective dependent claims thereof, comprises a temperature sensor for sensing the temperature of the surface of the hair being dried or of the air been blown by the hairdryer, a control unit and vibration means arranged in the body and, according to a preferred embodiment, in the handle which is grasped by the user during the use of the hairdryer. The temperature sensor is designed to send temperature information signals to the control unit and the vibration means are aimed to be ac-

tivated by the control unit when the sensed temperature reaches a first threshold value set by the producer and the control unit receives a correspondent signal from the temperature sensor for warning the user holding the hairdryer, and in particular grasping the handle, that the first temperature threshold has been reached.

[0012] In an embodiment, the temperature sensor is an infrared thermometer aimed to sense the temperature of the surface of the hair being dried or shaped.

[0013] In another embodiment, the control unit is programmed to stop the operation of heating means of the hot air generating means when the sensed temperature reaches a second threshold value higher than the first threshold value and the control unit receives a correspondent temperature signal from the sensor, for avoiding excessively high temperatures to be reached and hence possible damages to be caused to the user's hair.

[0014] In an embodiment the vibration means comprises a vibrator motor, while in an alternative embodiment the vibration means comprises a piezoelectric actuator.

[0015] The hairdryer may further comprises light emitting means arranged on the body, connected to the control unit and designed to provide visual information to the user concerning the temperature sensed by the temperature sensor, i.e. for instance designed to emit different visual signals depending on the temperature sensed by the sensor.

[0016] In particular in an embodiment, the light emitting means are designed to emit light of different colors depending on the range of temperature within which the average temperature sensed by the temperature sensor falls.

[0017] The light emitting means comprises, according to an embodiment, one or more LEDs.

[0018] In an embodiment, the light emitting means are arranged on the body around the air vent which is arranged laterally on the body with respect to the frontal blowing outlet.

[0019] In an alternative embodiment, the light emitting means are arranged on the body around the connection area of the handle to the air blowing portion of the body thus being easily visible for the user.

[0020] The method of functioning of a hairdryer realized in order to attain the aim of the present invention, explicated in the twelfth claim and the respective dependent claims thereof, comprises the operational steps of activating the hot air generating means in order to emit a flow of hot air, monitoring the temperature of the hair being dried or of the air been blown through the outlet by means of a temperature sensor, sending temperature information signals from the temperature sensor to the control unit of the hairdryer and activating a vibration means arranged in the body by means of the control unit when the latter receives a temperature information signal from the sensor related to a temperature equal or higher than a first threshold value set by the producer, for warning the user holding the body of the hairdryer that the first temperature threshold has been reached.

[0021] The hairdryer realized in order to attain the aim of the present invention is illustrated in the attached figures, where:

Figure 1 - is a first perspective view of a hairdryer according to the invention.

Figure 2 - is a second perspective view of a hairdryer according to the invention, wherein a part of the body of the hairdryer has been removed in order to show the internal components of the hairdryer.

[0022] The elements illustrated in the figures are numbered as follows:

1. Hairdryer
2. Body
3. Blowing outlet
4. Handle
5. Hot air generating means
6. Motor-driven fan
7. Control unit
8. Temperature sensor
9. Vibration means
10. Light emitting means
11. Air vent
12. Air blowing portion

[0023] The hairdryer 1 comprises a body 2 having a blowing outlet 3 through which air is emitted. The body 2 of the hairdryer 1 preferably comprises a handle 4, which is a portion of the body 2 suitable for being grasped by the user. In particular, the body 2 has a case-like shape aimed to define an internal protected space, where the internal components of the hairdryer 1 are placed. The hairdryer 1 further comprises hot air generating means 5 arranged in the body 2 and aimed to generate a flow of hot air to be emitted through the blowing outlet 3. In particular the hot air generating means 5 comprises a motor-driven fan 6 and heating means (not illustrated) electrically powered.

[0024] According to the embodiment illustrated in the attached Figures, the body 2 comprises an air blowing portion 12 provided with the blowing outlet 3 and wherein the hot air generating means 5 are arranged and the handle 4 is connected to the air blowing portion 12, in particular substantially perpendicular to it.

[0025] The hairdryer 1 comprises a control unit 7 arranged in the body 2 and a temperature sensor 8 for sensing the temperature of the surface of the hair being dried or of the air being blown through the blowing outlet 3. The sensor 8 is supported by the body 2 and it is connected to the control unit 7 for sending to it temperature information signals.

[0026] According to an embodiment, the sensor 8 is attached to the body 2 in proximity of the blowing outlet 3.

[0027] In particular, in the embodiment illustrated in the attached Figures, the temperature sensor 8 is an infrared thermometer aimed to sense the temperature of

the surface of the hair being dried or styled. To this aim the sensor 8 is attached to the body 2, protruding externally on the body 2 in correspondence of the blowing outlet 3, which is intended to be directed toward the user's hair when the hairdryer 1 is in use. This allows the temperature sensor 8 to be correctly oriented toward the hair of the user when the hairdryer 1 is in use for sensing the surface temperature of such hair, while at the same time avoiding possible damages to the sensor 8 or malfunctioning of the sensor 8 due to the hot air being blown through the outlet 3.

[0028] The hairdryer 1 according to the present invention further comprises vibration means 9 arranged in the body 2 and aimed to be activated by the control unit 7 when the latter receives a temperature information signal from the sensor 8 related to a temperature equal or higher of a first temperature threshold value, set by the producer, for warning the user that such first threshold temperature value has been reached.

[0029] According to an embodiment the first threshold value set for the temperature sensed by the sensor 8 is a value of temperature at which the hair are susceptible of getting damaged. For instance, in case the temperature sensor 8 is aimed to sense the temperature of the surface of the hair being dried, such first temperature threshold could be set at 70°C.

[0030] Therefore the hairdryer 1 of the present invention, thanks to the presence of the vibration means 9, is capable of reliably informing the user that a threshold temperature has been reached, thus allowing the user to select if the heating should be reduced or discontinued or if he/she prefers to continue drying the hair without intervening on the heating means, despite of the warning provided by the hairdryer 1. With respect to other possible warning means, the vibration means 9 is particularly effective, since the warning vibration is certainly felt by the user, which holds the body 2 of the hairdryer 1 while the hairdryer 1 is in use, whichever is the momentarily position of the hairdryer 1 with respect to the user's visual, like for instance also when the hairdryer 1 is positioned behind the head of the user.

[0031] In a preferred embodiment illustrated in the attached figures, the vibration means 9 is arranged in the handle 4 of the body 2. This enhances the vibration feeling transmitted to the user due to the fact that the handle 4 is grasped by the user while the hairdryer 1 is in use.

[0032] According to an embodiment, the control unit 7 is programmed to stop the operation of the heating means of the hot air generating means 5 when it receives a temperature information signal from the sensor 8 related to a sensed temperature that reaches a second threshold value, as well set by the producer, higher than the first threshold value the temperature sensor 8. This allows to enhance the safety of use of the hairdryer 1, maintaining the temperature sensed by the sensor 8, i.e. for instance the temperature of the surface of the hair being dried or of the air blown, within an upper limit temperature above which the temperature is considered to be harmful for

the user.

[0033] In an embodiment, the vibration means 9 comprises a vibrator motor, which is both economic and functioning reliable.

[0034] In an alternative embodiment the vibration means 9 comprises a piezoelectric actuator, which can provide high-vibration force.

[0035] According to a further embodiment, the hairdryer 1 comprises light emitting means 10 arranged on the body 2 and connected to the control unit 7 for providing visual information to the user concerning the temperature sensed by the sensor 8, i.e. concerning the temperature reached by the surface of the hair being dried or reached by the air emitted through the blowing outlet 3. The light emitting means 10 allows the user to visually monitor, in a simple and intuitive manner, the temperature sensed by the sensor 8.

[0036] In a version of this embodiment, the light emitting means 10 are designed to emit light of different colors depending on the range of temperature within which the average temperature sensed by the temperature sensor 8 falls. This allows the user to visually monitor the range of temperature within which the temperature of the surface of the hair or of the air emitted through the blowing outlet 3 falls.

[0037] For instance the light emitting means 10 could be designed in order to emit a blue color when the temperature sensed by the sensor 8 falls within the range of temperature between 40°C and 50°C, to emit a green color when the temperature sensed by the sensor 8 falls within the range of temperature between 50°C and 60°C, to emit an orange color when the temperature sensed by the sensor 8 falls within the range of temperature between 60°C and 70°C and to emit a red color when the temperature sensed by the sensor 8 is above 70°C. In this manner the user can be clearly and easily informed concerning the range of temperature within which the temperature of the surface of the hair or the temperature of the air blown by the hairdryer 1 falls, thus having the possibility to control the functioning parameters of the hairdryer 1 in a more accurate and conscious manner.

[0038] According to an embodiment, the light emitting means 10 comprises one or more LEDs, which are economical and require low energy for functioning. In particular the light emitting means 10 can comprise RGB Color Changing LED, which are capable of producing numerous different color shades.

[0039] In an embodiment, the body 2 comprises at least one lateral air vent 11, which is arranged on a side of the body 2, considering the blowing outlet 3 being arranged frontally on the body 2 and which is advantageously defined by a plurality of apertures. The light emitting means 10 are arranged on the body 2 around the at least one lateral air vent 11. This position ensures to the light emitting means 10 a good visibility on the body 2.

[0040] According to an alternative embodiment, the light emitting means 10 are arranged on the body 2 around the connection area of the handle 4 to the air

blowing portion 12. This allows the light emitting means 10 to be easily seen by the user, for most of the positions and orientations of the hairdryer 1 while in use.

[0041] The present invention comprises also a method of functioning of a hairdryer 1, in particular as above specified, for which the same reference numbers will be maintained.

[0042] The method according to the invention comprises activating the hot air generating means 5 in order to emit a flow of hot air through the blowing outlet 3 of the body 2 of the hairdryer 1.

[0043] In particular the hot air generating means 5 are activated by means of the control unit 7 upon command of the user, for instance by acting on one or more buttons or levers by means of which it is possible to turn on and off the hairdryer 1 and for instance to set the temperature and the speed of the air to be emitted through the blowing outlet 3.

[0044] The method further comprises monitoring the temperature of the hair being dried or of the air been blown through the outlet 3 by means of the temperature sensor 8 and sending temperature information signals from the temperature sensor 8 to the control unit 7.

[0045] The method according to the invention comprises hence activating the vibration means 9 arranged in the body 2 of the hairdryer 1 and preferably in the handle 4 by means of the control unit 7, when the temperature sensed by the sensor 8 reaches a first threshold value, set by the producer, and the control unit 7 receives a correspondent temperature information signal from the sensor 8, for warning the user holding the body 2 that the first temperature threshold has been reached.

[0046] In an embodiment, the method further comprises stopping the operation of the heating means of the hot air generating means 5 by means of the control unit 7 when the sensed temperature reaches a second threshold value higher than the first threshold value and as well set by the producer and the control unit 7 receives a correspondent temperature information signal from the sensor 8.

[0047] In a further embodiment the method comprises commanding the light emitting means 10 arranged on the body 2 of the hairdryer 1 to emit a light for providing visual information to the user concerning the temperature sensed by the sensor 8.

[0048] In a version of this embodiment, the method further comprises commanding the light emitting means 10 to emit a light of a first color by means of the control unit 7, when the latter receives a temperature signal from the sensor 8 falling within a first range of temperatures, and commanding the light emitting means 10 to emit a light of a second color, different from the first color, by means of the control unit 7 when the latter receives a temperature signal from the sensor 8, falling within a second range of temperatures different from the first range temperature.

[0049] The hairdryer 1 and the method according to the present invention ensures an optimal flexibility in use,

while avoiding possible damages to the hair being dried or styled by accurately informing the user when an excessively high temperature is being reached by the surface of the hair or by the air blown by the hairdryer 1.

[0050] Moreover the hairdryer 1 and the method allow the user to comfortably use the hairdryer being ensured to be promptly informed on the excessively high temperature being reached whichever is the momentarily position of the hairdryer, since it is not necessary for the user to visualize the hairdryer 1 in order to be informed.

Claims

1. A hairdryer (1) comprising:

- a body (2) having a blowing outlet (3) through which air is emitted;
 - hot air generating means (5) arranged in the body (2) and arranged to generate a flow of hot air to be emitted through the blowing outlet (3);
 - a control unit (7) arranged in the body (2);
 - a temperature sensor (8) for sensing the temperature of the surface of the hair being dried or of the air been blown through the outlet (3), which sensor (8) is supported by the body (2) and it is connected to the control unit (7) for sending to it temperature information signals;
- characterized in that** it further comprises vibration means (9) arranged in the body (2) and arranged to be activated by the control unit (7) when the temperature sensed by the sensor (8) reaches a first threshold value set by the producer and the control unit (7) receives a correspondent temperature information signal from the sensor (8), for warning the user holding the body (2) of the hairdryer (1) that the first temperature threshold has been reached.

2. A hairdryer (1) as in Claim 1, **characterized in that** the body (2) of the hairdryer (1) comprises a handle (4) and the vibration means (9) are arranged in the handle (4) of the body (2).

3. A hairdryer (1) as in Claim 1 or 2, **characterized in that** the temperature sensor (8) is an infrared thermometer arranged to sense the temperature of the surface of the hair being dried.

4. A hairdryer (1) as in any of the preceding claims, **characterized in that** the control unit (7) is programmed to stop the operation of heating means of the hot air generating means (5) when the sensed temperature reaches a second threshold value set by the producer higher than the first threshold value and the control unit (7) receives a correspondent temperature information signal from the sensor (8).

5. A hairdryer (1) as in any of the preceding claims, **characterized in that** the vibration means (9) comprises a vibrator motor.

6. A hairdryer (1) as in any of the claims 1-4, **characterized in that** the vibration means (9) comprises a piezoelectric actuator.

7. A hairdryer (1) as in any of the preceding claims, **characterized in that** it further comprises light emitting means (10) arranged on the body (2) and connected to the control unit (7) for providing visual information to the user concerning the temperature sensed by the temperature sensor (8).

8. A hairdryer (1) as in Claim 7, **characterized in that** the light emitting means (10) are designed to emit light of different colors depending on the range of temperature within which the average temperature sensed by the temperature sensor (8) falls.

9. A hairdryer (1) as in Claim 7 or 8, **characterized in that** the light emitting means (10) comprises one or more LEDs.

10. A hairdryer (1) as in any of the claims 7-9, **characterized in that** the body (2) comprises at least one lateral air vent (11) and the light emitting means (10) are arranged on the body (2) around the at least one lateral air vent (11).

11. A hairdryer (1) as in any of the claims 7-9, **characterized in that** the body (2) comprises an air blowing portion (12) having the blowing outlet (3) and wherein the hot air generating means (5) are arranged, the handle (4) being connected to the air blowing portion (12) and the light emitting means (10) being arranged on the body (2) around the connection area of the handle (4) to the air blowing portion (12).

12. A method of functioning of a hairdryer (1) according to any one of claims 1 to 11, the method comprising:

- activating hot air generating means (5) in order to emit a flow of hot air through a blowing outlet (3) of a body (2) of the hairdryer (1);
- monitoring the temperature of the hair being dried or of the air been blown through the outlet (3) by means of a temperature sensor (8);
- sending temperature information signals from the temperature sensor (8) to a control unit (7) of the hairdryer (1); and
- activating a vibration means (9) arranged in the body (2) of the hairdryer (1) by means of the control unit (7) when the temperature sensed by the sensor (8) reaches a first threshold value set by the producer and the control unit (7) receives a correspondent temperature information signal

from the sensor (8), for warning the user holding the body (2) of the hairdryer (1) that the first temperature threshold has been reached.

13. A method of functioning of a hairdryer (1) as in claim 12 further comprising:

- stopping the operation of heating means of the hot air generating means (5) by means of the control unit (7) when the sensed temperature reaches a second threshold value set by the producer higher than the first threshold value and the control unit (7) receives a correspondent temperature information signal from the sensor (8).

14. A method of functioning of a hairdryer (1) as in claim 12 or 13, further comprising commanding light emitting means (10) arranged on the body (2) of the hairdryer (1) and connected to the control unit (7) to emit a light of a preset color for providing visual information to the user concerning the temperature sensed by the sensor (8).

15. A method of functioning of a hairdryer (1) as in claim 14 further comprising:

- commanding the light emitting means (10) to emit a light of a first color by means of the control unit (7) when the latter receives a temperature information signal from the sensor (8) falling within a first range of temperatures; and
- commanding the light emitting means (10) to emit a light of a second color, different from the first color, by means of the control unit (7) when the latter receives a temperature information signal from the sensor (8), falling within a second range of temperatures different from the first range temperature.

Patentansprüche

1. Ein Haartrockner (1) umfasst:

- einen Körper (2) mit einer Ausblasöffnung (3), durch den die Luft abgegeben wird;
- eine Heißluft erzeugungseinrichtung (5), die in dem Körper (2) angeordnet und angeordnet sind, um einen Heißluftstrom zu erzeugen, der durch die Ausblasöffnung (3) abgegeben wird;
- eine Steuereinheit (7), die in dem Körper (2) angeordnet ist;
- einen Temperatursensor (8) für das Erfassen der Temperatur der Oberfläche des zu trocknenden Haares oder der Luft, die durch den Auslass (3) geblasen wird, wobei der Sensor (8) vom Körper (2) getragen wird und mit der Steuerein-

heit (7) verbunden ist, um Temperaturinformationssignale an ihn zu senden;

gekennzeichnet ist es dadurch, dass es darüber hinaus einen Vibrationsmittel (9) umfasst, das in dem Körper (2) angeordnet ist und von der Steuereinheit (7) aktiviert wird, wenn die vom Sensor (8) erfasste Temperatur einen ersten Schwellenwert erreicht und die Steuereinheit (7) ein entsprechendes Temperaturinformationssignal vom Sensor (8) empfängt, für die Warnung des Benutzers, der den Körper (2) des Haartrockners (1) hält, dass die erste Temperaturschwelle erreicht wurde.

2. Ein Haartrockner (1), wie in Anspruch 1 aufgeführt, **ist dadurch gekennzeichnet, dass** der Körper (2) des Haartrockners (1) einen Griff (4) aufweist, wobei das Vibrationsmittel (9) im Griff (4) des Körpers (2) angeordnet ist.

3. Ein Haartrockner (1), wie in Anspruch 1 oder 2 aufgeführt, **ist dadurch gekennzeichnet, dass** der Temperatursensor (8) ein InfrarotThermometer ist, welches dafür angeordnet ist, um die Temperatur der Oberfläche des zu trocknenden Haares zu erfassen.

4. Ein Haartrockner (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** die Steuereinheit (7) so programmiert ist, dass sie den Betrieb der Heizeinrichtung der Heißluft erzeugungseinrichtung (5) anhält, wenn die erfasste Temperatur einen zweiten Schwellenwert erreicht, der höher als der erste Schwellenwert ist und die Steuereinheit (7) ein entsprechendes Temperaturinformationssignal vom Sensor (8) empfängt.

5. Ein Haartrockner (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** das Vibrationsmittel (9) einen Vibrationsmotor umfasst.

6. Ein Haartrockner (1), wie in Anspruch 1-4 aufgeführt, **ist dadurch gekennzeichnet, dass** das Vibrationsmittel (9) einen piezoelektrischen Aktuator umfasst.

7. Ein Haartrockner (1), wie in einem der vorherigen Ansprüchen aufgeführt, **ist dadurch gekennzeichnet, dass** es einen Lichtemissionsmittel (10) umfasst, die an dem Körper (2) angeordnet und mit der Steuereinheit (7) verbunden ist, um dem Benutzer visuelle Informationen in Bezug der vom Temperatursensor (8) erfassten Temperatur bereitzustellen.

8. Ein Haartrockner (1), wie in Anspruch 7 aufgeführt, **ist dadurch gekennzeichnet, dass** das Lichtemissionsmittel (10) so ausgelegt ist, dass es Licht in unterschiedlicher Farbe in Abhängigkeit von dem

Temperaturbereich emittiert, in den die vom Temperatursensor (8) erfasste Durchschnittstemperatur fällt.

9. Ein Haartrockner (1), wie in Anspruch 7 oder 8 aufgeführt, **ist dadurch gekennzeichnet, dass** das Lichtemissionsmittel (10) eine oder mehrere LEDs umfasst. 5
10. Ein Haartrockner (1), wie in einem der Ansprüche 7-9 aufgeführt, **ist dadurch gekennzeichnet, dass** der Körper (2) mindestens eine seitliche Entlüftung (11) umfasst, wobei die Lichtemissionsmittel (10) auf dem Körper (2) um die mindestens eine seitliche Entlüftung (11) angeordnet sind. 10
11. Ein Haartrockner (1), wie in einem der Ansprüche 7-9 aufgeführt, **ist dadurch gekennzeichnet, dass** der Körper (2) einen Luftblasabschnitt (12) mit der Ausblasöffnung (3) umfasst und worauf die Heißluf- 20
terzeugungseinrichtung (5) angeordnet sind, wobei der Griff (4) mit dem Luftblasabschnitt (12) verbunden ist und die Lichtemissionseinrichtung (10) auf dem Körper (2) um den Verbindungsbereich des Griffs (4) mit dem Luftblasabschnitt (12) angeordnet ist. 25
12. Ein Verfahren zum Funktionieren des Haartrockners (1) umfasst: 30
- das Aktivieren der Heißluf-
terzeugungseinrichtung (5), um einen Heißluftstrom durch eine Aus-
blasöffnung (3) eines Körpers (2) des Haartrock-
ners (1) zu emittieren;
- das Überwachen der Temperatur des zu trocken- 35
enden Haares oder der durch den Auslass (3)
geblasenen Luft mithilfe eines Temperatursen-
sors (8);
- das Senden von Temperaturinformationssigna- 40
len vom Temperatursensor (8) zu einer Steuer-
einheit (7) von dem Haartrockner (1); und
- das Aktivieren eines im Körper (2) des Haar-
trockners (1) angeordneten Vibrationsmittel (9)
mithilfe der Steuereinheit (7), wenn die vom 45
Sensor (8) erfasste Temperatur einen ersten
Schwellenwert erreicht hat, so empfängt die
Steuereinheit (7) ein entsprechendes Tempera-
turinformationssignal vom Sensor (8), um den
Benutzer, der den Körper (2) des Haartrockners 50
(1) hält, zu warnen, dass die erste Temperat-
urschwelle erreicht wurde.
13. Ein Verfahren zum Funktionieren des Haartrockners (1) nach Anspruch 12 umfasst des Weiteren: 55
- das Einstellen des Betriebs der Heizeinrich-
tung der Heißluf-
terzeugungseinrichtung (5) mit-
hilfe der Steuereinheit (7), wenn die erfasste

Temperatur einen zweiten Schwellenwert er-
reicht, der höher als der erste Schwellenwert ist,
und die Steuereinheit (7) eine entsprechende
Temperatur empfängt Informationssignal vom
Sensor (8).

14. Ein Verfahren zum Funktionieren des Haartrockners (1) nach Anspruch 12 oder 13 umfasst des Weiteren Befehlslicht emittierendes Mittel (10), das auf dem Körper (2) des Haartrockners (1) angeordnet und mit der Steuereinheit (7) verbunden ist, um ein Licht einer voreingestellten Farbe zu emittieren, um dem Benutzer visuelle Informationen bezüglich der vom Sensor (8) erfassten Temperatur weiterzugeben.
15. Ein Verfahren zum Funktionieren des Haartrockners (1) nach Anspruch 14 umfasst des Weiteren:
- Befehlslicht emittierendes Mittel (10), das mit-
hilfe der Steuereinheit (7) ein Licht einer ersten
Farbe emittiert, wenn dieser ein Temperaturin-
formationssignal vom Sensor (8) empfängt, das
in einen ersten Temperaturbereich fällt; und
- Befehlslicht emittierende Mittel (10), das mit-
hilfe der Steuereinheit (7) ein Licht einer zweiten
Farbe, die sich von der ersten Farbe unterscheidet,
ausgibt, wenn dieser ein Temperaturinfor-
mationssignal vom Sensor (8) empfängt, das in
einen zweiten Temperaturbereich fällt, der sich
von der Temperatur im ersten Bereich unter-
scheidet.

Revendications

1. Un sèche-cheveux (1) comprenant :

- un corps (2) ayant une sortie de soufflage (3) par laquelle l'air est émis ;
 - des moyens de génération d'air chaud (5) disposés dans le corps (2) et agencés pour générer un flux d'air chaud à émettre par la sortie de soufflage (3) ;
 - une unité de contrôle (7) disposée dans le corps (2) ;
 - un capteur de température (8) pour détecter la température de la surface des cheveux en cours de séchage ou de l'air soufflé par la sortie (3), lequel capteur (8) est supporté par le corps (2) et il est relié à l'unité de commande (7) pour lui envoyer des signaux d'information sur la température ;
- est caractérisé en ce qu'il** comprend en outre des moyens de vibration (9) disposés dans le corps (2) et agencés pour être activés par l'unité de commande (7) lorsque la température détectée par le capteur (8) atteint une première valeur de seuil et que l'unité de commande (7) reçoit

- un signal d'information de température correspondant du capteur (8), pour avertir l'utilisateur tenant le corps (2) du sèche-cheveux (1) que le premier seuil de température a été atteint.
2. Un sèche-cheveux (1) selon la déclaration 1, **est caractérisé en ce que** le corps (2) du sèche-cheveux (1) comprend une poignée (4) et les moyens de vibration (9) sont disposés dans la poignée (4) du corps (2).
 3. Un sèche-cheveux (1) selon la déclaration 1 ou 2, **est caractérisé en ce que** le capteur de température (8) est un thermomètre à infrarouge agencé pour détecter la température de la surface des cheveux en cours de séchage.
 4. Un sèche-cheveux (1) selon l'une des déclarations précédentes, **est caractérisé en ce que** l'unité de commande (7) est programmée pour arrêter le fonctionnement des moyens de chauffage des moyens de génération d'air chaud (5) lorsque la température détectée atteint une deuxième valeur de seuil supérieure à la première valeur de seuil et l'unité de commande (7) reçoit un signal d'information de température correspondant du capteur (8).
 5. Un sèche-cheveux (1) selon l'une des déclarations précédentes, **est caractérisé en ce que** le moyen de vibration (9) comprend un moteur de vibreur.
 6. Un sèche-cheveux (1) selon l'une des déclarations 1 à 4, **est caractérisé en ce que** le moyen de vibration (9) comprend un actionneur piézoélectrique
 7. Un sèche-cheveux (1) selon l'une des déclarations précédentes, **est caractérisé en ce qu'il** comprend en outre des moyens d'émission de lumière (10) disposés sur le corps (2) et reliés à l'unité de commande (7) pour fournir à l'utilisateur des informations visuelles concernant la température détectée par le capteur de température (8).
 8. Un sèche-cheveux (1) selon la déclaration 7, **est caractérisé en ce que** les moyens d'émission de lumière (10) sont conçus pour émettre de la lumière de différentes couleurs en fonction de la plage de température dans laquelle se situe la température moyenne détectée par le capteur de température (8).
 9. Un sèche-cheveux (1) selon la déclaration 7 ou 8, **est caractérisé en ce que** le moyen d'émission de lumière (10) comprend une ou plusieurs LED.
 10. Un sèche-cheveux (1) selon l'une des revendications 7 à 9, **est caractérisé en ce que** le corps (2) comprend au moins un orifice d'aération latéral (11) et les moyens d'émission de lumière (10) sont disposés sur le corps (2) autour d'au moins un orifice d'aération latéral (11).
 11. Un sèche-cheveux (1) selon l'une des déclarations 7 à 9, **est caractérisé en ce que** le corps (2) comprend une partie de soufflage d'air (12) ayant la sortie de soufflage (3) et dans laquelle sont disposés les moyens de génération d'air chaud (5), la poignée (4) étant connectée à la partie de soufflage d'air (12) et les moyens d'émission de lumière (10) étant disposés sur le corps (2) autour de la zone de connexion de la poignée (4) à la partie de soufflage d'air (12).
 12. Un mode de fonctionnement d'un sèche-cheveux (1) comprenant :
 - l'activation de moyens de génération d'air chaud (5) afin d'émettre un flux d'air chaud à travers une sortie de soufflage (3) d'un corps (2) du sèche-cheveux (1) ;
 - surveiller la température des cheveux en cours de séchage ou de l'air soufflé par la sortie (3) au moyen d'un capteur de température (8) ;
 - l'envoi de signaux d'information sur la température du capteur de température (8) à une unité de commande (7) du sèche-cheveux (1) ; et
 - activer des moyens de vibration (9) disposés dans le corps (2) du sèche-cheveux (1) au moyen de l'unité de commande (7) lorsque la température détectée par le capteur (8) atteint une première valeur de seuil et que l'unité de commande (7) reçoit un signal d'information de température correspondant du capteur (8), pour avertir l'utilisateur tenant le corps (2) du sèche-cheveux (1) que le premier seuil de température a été atteint.
 13. Une méthode de fonctionnement d'un sèche-cheveux (1) comme dans la déclaration 12 comprenant en outre :
 - l'arrêt du fonctionnement des moyens de chauffage des moyens de production d'air chaud (5) au moyen de l'unité de commande (7) lorsque la température détectée atteint une deuxième valeur de seuil supérieure à la première valeur de seuil et que l'unité de commande (7) reçoit un signal d'information de température correspondant du capteur (8).
 14. Une méthode de fonctionnement d'un sèche-cheveux (1) selon la déclaration 12 ou 13, comprenant en outre des moyens d'émission de lumière de commande (10) disposés sur le corps (2) du sèche-cheveux (1) et connectés à l'unité de commande (7) pour émettre une lumière d'une couleur prédéfinie afin de fournir des informations visuelles à l'utilisateur concernant la température détectée par le capteur (8).

15. Une méthode de fonctionnement d'un sèche-cheveux (1) comme dans la déclaration 14 comprenant en outre :

- commander le moyen d'émission de lumière (10) pour qu'il émette une lumière d'une première couleur au moyen de l'unité de commande (7) lorsque celle-ci reçoit un signal d'information de température du capteur (8) tombant dans une première gamme de températures ; et
- commander le moyen d'émission de lumière (10) pour qu'il émette une lumière d'une deuxième couleur, différente de la première, au moyen de l'unité de commande (7) lorsque celle-ci reçoit un signal d'information de température du capteur (8), tombant dans une deuxième plage de températures différente de la première.

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Figure 1

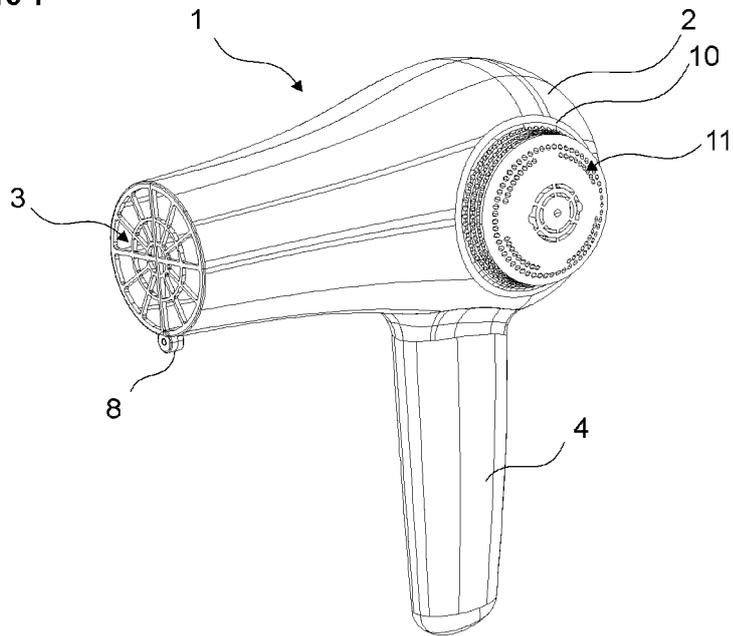
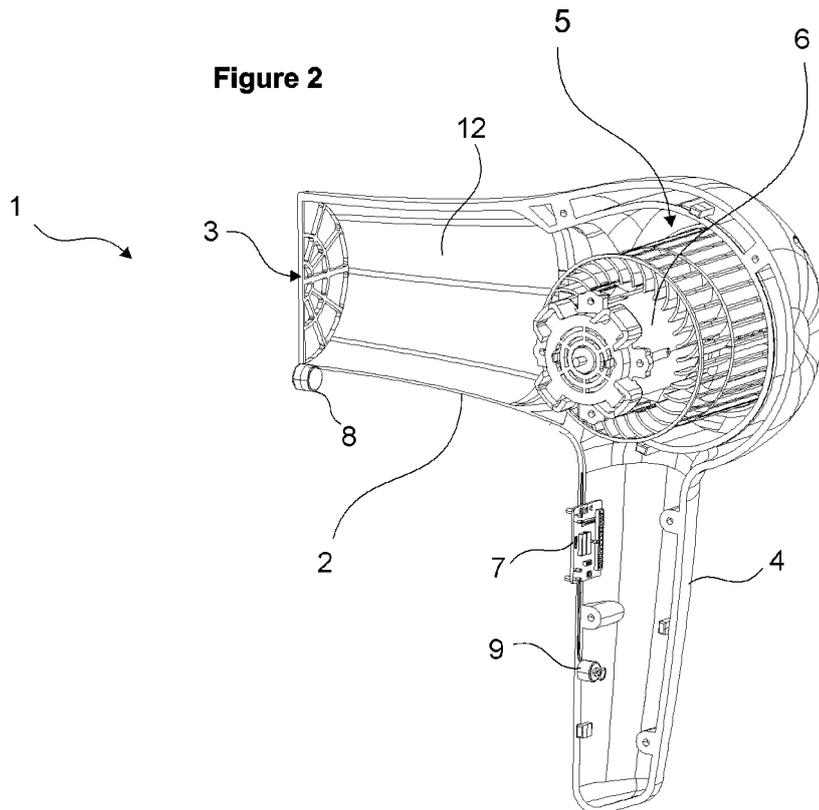


Figure 2



REFERENCES CITED IN THE DESCRIPTION

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