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(71) Applicant: **Kenford Industrial Co., Ltd.**
Hong Kong (CN)

(72) Inventors:
• **KEONG, Wai Ho**
Hong Kong (CN)
• **LOK, Chun Yin**
Hong Kong (CN)

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(54) **HAIR CURLING DEVICE**

(57) A hair curling device comprises a grip (6), an electric heating element (2) installed on the grip (6), an ion generator (4), a three-dimensional control interface (1) with a button (33), and a display screen (5). The three-dimensional control interface (1) simultaneously con-

nects to and controls the electrothermal element (2), the ion generator (4) and the display screen (5), and adjusts at least one functional element through the button (33) so as to adjust different functions of the hair curling device, including temperature adjustment of the electrothermal element (2) and adjustment of the ion generator (4).

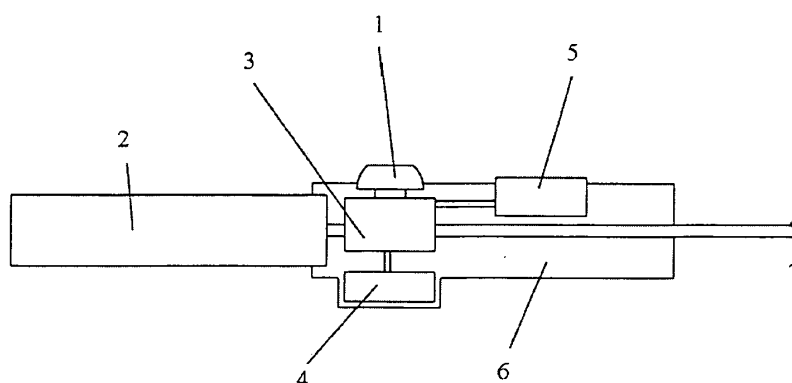


Fig. 2

Description

FIELD OF THE INVENTION

[0001] This present invention relates generally to hair care products, and more specifically, to a electrothermal hair curling device.

BACKGROUND OF THE INVENTION

[0002] There are wide varieties of electrothermal perm equipments currently, such as various hair curling devices. These hair curling devices generally comprise a lower clamping plate installed with a electric heating plate and an upper clamping plate controlled by a handle. The control interface of these hair curling devices are in the form of a flat button, and there devices don't provide a display screen to show temperature of the heating elements in real time, therefore operation of these hair curling devices when used by users is very inconvenient. In addition, the existing hair curling devices only simply utilize electric heating or ion to straighten hair, and the effect for hair straightening is not very good, especially operation of these devices are inconvenient.

SUMMARY OF THE INVENTION

[0003] The technical problem to be solved of the preset invention is to provide a hair curling device having a three-dimensional control interface which can conveniently control the heating elements, the ion generator and the display screen to facilitate user's operation, in order to overcome the above-mentioned disadvantages of the prior art.

[0004] According an aspect of the present invention, a hair curling device is provided, comprising a grip, an electric heating element installed on the grip, an ion generator, a three-dimensional control interface having a button; the three-dimensional control interface simultaneously connects to and controls the electric heating element and the ion generator.

[0005] Advantageously, the three-dimensional control interface has a base with a displacement, and the button is embedded into the displacement, the three-dimensional control interface connects to and controls other different functional elements of the hair curling device, and adjusts at least one functional element through displacing of the button along the displacement.

[0006] Advantageously, the three-dimensional control interface controls the hair curling device through the button displacing toward different directions.

[0007] Advantageously, the three-dimensional control interface connects to and controls a switch and a display screen of the hair curling device.

[0008] Advantageously, the electric heating element is a pipe-shaped heating element, and hair is wound on the heating element when it is used.

[0009] Advantageously, the three-dimensional control

interface is changeable toward at least three different directions in the three-dimensional space, including directions between the negative X-axis, the positive X-axis, the negative Y-axis, the positive Y-axis, the negative Z-axis, and the positive Z-axis, and the negative X-axis, the positive X-axis, the negative Y-axis, the positive Y-axis, the negative Z-axis, and the positive Z-axis of the same button.

[0010] Advantageously, displacing directions of the button comprise directions between the negative X-axis, the positive X-axis, the negative Y-axis, the positive Y-axis, the negative Z-axis, and the positive Z-axis; and the negative X-axis, the positive X-axis, the negative Y-axis, the positive Y-axis, the negative Z-axis, and the positive Z-axis of the same button.

[0011] Advantageously, the three-dimensional control interface has a base with a cross-shaped displacement, and the button is embedded into the cross-shaped displacement of the base and is capable of displacing back and forth along the displacement.

[0012] Advantageously, the button of the three-dimensional control interface has arbitrary shape, such as rod-shaped or cross-shaped.

[0013] Advantageous effect of the present invention lies in as below: 1) the three-dimensional control interface is easy to use and operate; 2) the hair curling device combines the thermal effect of the heating element with the ionic effect to achieve the purpose of curling hair, thus the hair curling effect is better; 3) working status of the hair curling device is shown on the display screen to facilitate the users adjusting the hair curling device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0014] The accompanying drawings illustrate one or more embodiments of the invention and, together with the written description, serve to explain the principles of the invention, and wherein:

Fig. 1 is a structural diagram of a hair curling device of the present invention.

Fig. 2 is a structural diagram showing inner structure of the hair curling device in accordance with a first embodiment of the present invention.

Fig. 3a, Fig. 3b, and Fig. 3c are structural diagrams of a control interface of the hair curling device in accordance with an embodiment of the present invention.

Fig. 4a, Fig. 4b, Fig. 4c, and Fig. 4d are structural diagrams of the control interface of the hair curling device in accordance with an embodiment of the present invention.

Fig. 5a, Fig. 5b and Fig. 5c are structural diagrams showing the control interface and the inner structure of the hair curling device in accordance with other two embodiments of the present invention, respectively.

Fig. 6 is a schematic diagram showing use of the

hair curling device in accordance with an embodiment of the present invention.

Fig. 7 is a circuit diagram showing electrical connection of the hair curling device in accordance with an embodiment of the present invention.

DETAILED DESCRIPTION OF THE INVENTION

[0015] As shown in Fig. 1 and Fig. 2, an embodiment of the present invention comprises the following components: a three-dimensional control interface 1, an electric heating element 2, a control unit 3, an ion generator 4, a display screen 5, a grip 6, and power lines 7. The grip 6 is cuboid-shaped, the cylindrical electric heating element 2 is installed on one end of the grip 6, and the other end of the grip 6 is connected with the power lines 7. The three-dimensional control interface 1 and the display screen 5 are arranged on the outer side of the grip 6, while the ion generator 4 is arranged on the inner side of the grip 6. The control unit 3 connects the electric heating element 2, the ion generator 4, and the display screen 5 into a functional related whole one via wire connections.

[0016] Fig. 3a, Fig. 3b, and Fig. 3c are structural diagrams of the control interface of the hair curling device in accordance with an embodiment of the present invention. The button on the three-dimensional control interface may displace back and forth toward four horizontal directions indicated by 11, 12, 13 and 14, and may displace back and forth toward two vertical directions indicated by 15 and 16.

[0017] Fig. 4a, Fig. 4b, Fig. 4c, and Fig. 4d are structural diagrams of the three-dimensional control interface of the hair curling device in accordance with embodiments of the present invention. As shown in these figures, in the right hand coordinate system, the four directions 11, 12, 13, 14 are four directions in a plane defined by X-axis and Y-axis, the directions 15, 16 are two directions in Z-axis, wherein, the direction 14 corresponds to the positive X-axis, while the direction 13 corresponds to the negative X-axis; the direction 11 corresponds to the positive Y-axis, while the direction 12 corresponds to the negative Y-axis; the direction 15 corresponds to the positive Z-axis, while the direction 16 corresponds to the negative Z-axis. The button 33 of the three-dimensional control interface 1 may displace back and forth in the above directions.

[0018] Fig. 5a and Fig. 5b are structural diagrams showing the control interface of the hair curling device in accordance with other two embodiments of the present invention. In the embodiment as shown in Fig. 5a, the button 33 of the three-dimensional control interface 1 may displace along a straight line path 17 to reach different positions. In the embodiment as shown in Fig. 5b, the button of the three-dimensional control interface 1 may displace along a arc path 18 to reach different positions.

[0019] Fig. 5c is a structural diagram showing the inner structure of the three-dimensional control interface 1 of

the hair curling device in accordance with embodiments of the present invention. As shown in Fig. 5c, the three-dimensional control interface 1 comprises a base 31 having a cross-shaped displacement 32, and a button 33 embedded into the displacement 32. The button 33 may displace back and forth along the displacement 32 toward the four horizontal directions and the two vertical directions as shown in Fig. 3 and Fig. 4.

[0020] Fig. 6 is a schematic diagram showing use of the hair curling device in accordance with an embodiment of the present invention. As shown in Fig. 6, when using the hair curling device, hair is spirally wound on the cylindrical electric heating element 2, then heat is transferred from the electric heating element 2 to the hair, to curl the hair.

[0021] Fig. 7 is a circuit diagram showing electrical connection of the hair curling device in accordance with an embodiment of the present invention. As a center, the control unit 3 connects the three-dimensional control interface 1, the electric heating element 2, the ion generator 4, the display screen 5, the power supply 7, and the relevant elements 8 into a whole one via wire connections. The display screen 5 is a LCD display screen. The relevant elements 8 may comprise a power indicator, a working status indicator, a buzzer alarm and so on. The hair curling device of the present invention utilizes AC power supply.

Claims

1. A hair curling device, comprising a grip (6), an electric heating element (2) installed on the grip (6), an ion generator (4), a three-dimensional control interface (1) with a button (33); the three-dimensional control interface (1) simultaneously connects to and controls the electric heating element (2) and the ion generator (4).
2. The hair curling device according to claim 1, wherein the three-dimensional control interface (1) has a base (31) with a displacement (32), and the button (33) is embedded into the displacement (32), the three-dimensional control interface (1) connects to and controls other different functional elements of the hair curling device, and adjusts at least one functional element through displacing of the button (33).
3. The hair curling device according to claim 2, wherein the three-dimensional control interface (1) controls the hair curling device through the button (33) displacing toward different directions.
4. The hair curling device according to claim 1, wherein a display screen (5) is arranged on the grip (6), and the three-dimensional control interface (1) connects to and controls the display screen (5) of the hair curling device.

5. The hair curling device according to claim 1, wherein the electric heating element (2) is a pipe-shaped heating element, hair is wound on the heating element when it is used.

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6. The hair curling device according to claim 1, wherein the three-dimensional control interface (1) is changeable toward at least three different directions in the three-dimensional space, including directions between the negative X-axis, the positive X-axis, the negative Y-axis, the positive Y-axis, the negative Z-axis, and the positive Z-axis, and the negative X-axis, the positive X-axis, the negative Y-axis, the positive Y-axis, the negative Z-axis, and the positive Z-axis of the same button.

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7. The hair curling device according to claim 3, wherein displacing directions of the button (3) comprise directions between the negative X-axis, the positive X-axis, the negative Y-axis, the positive Y-axis, the negative Z-axis, and the positive Z-axis, and the negative X-axis, the positive X-axis, the negative Y-axis, the positive Y-axis, the negative Z-axis, and the positive Z-axis of the same button.

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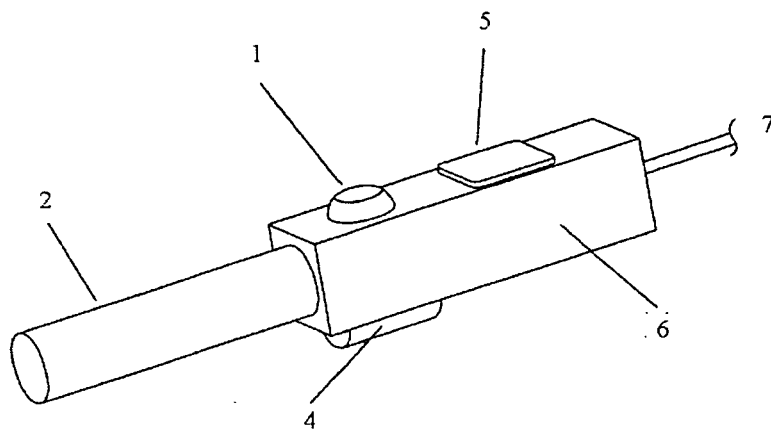


Fig. 1

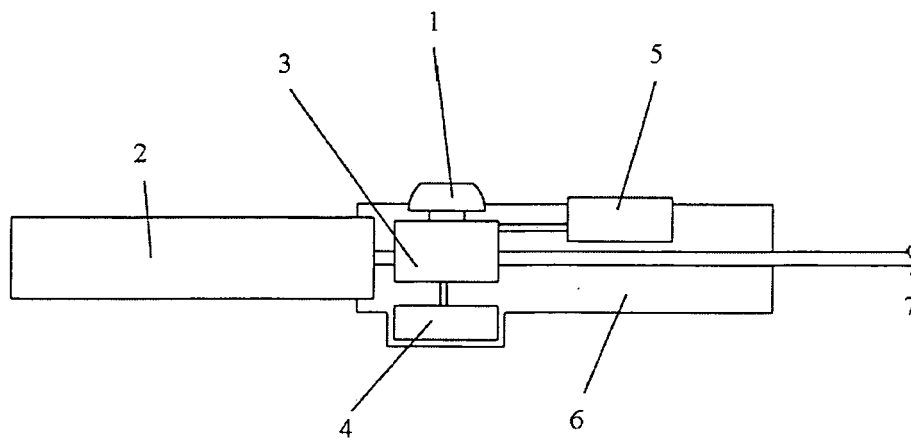


Fig. 2

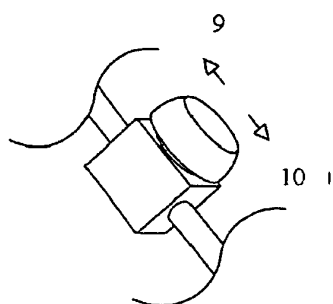


Fig. 3a

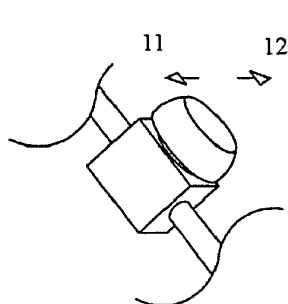


Fig. 3b

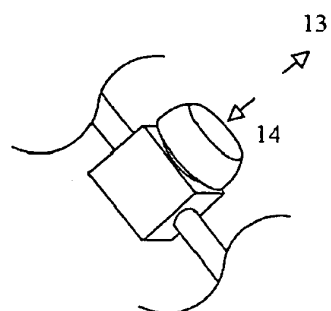


Fig. 3c

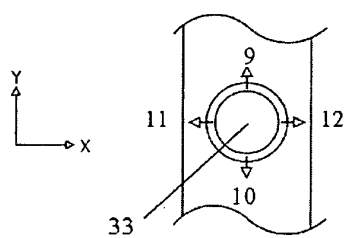


Fig. 4a

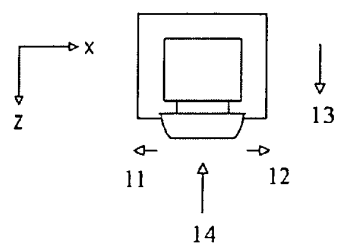


Fig. 4b

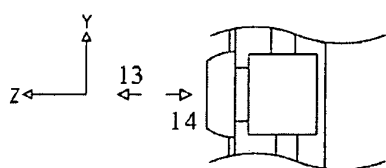


Fig. 4c

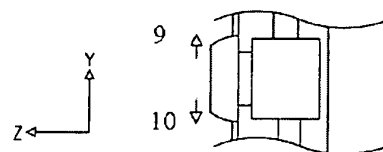


Fig. 4d

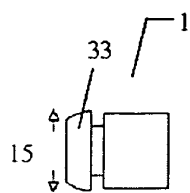


Fig. 5a



Fig. 5b

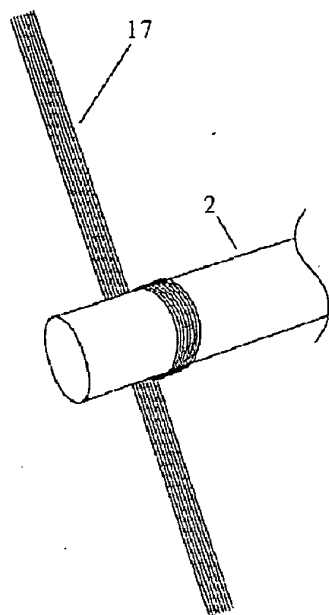


Fig. 6

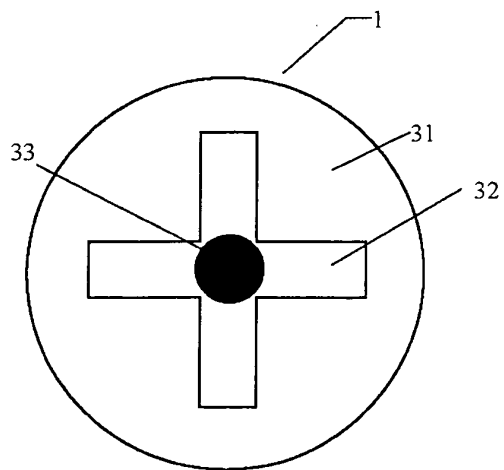


Fig. 5c

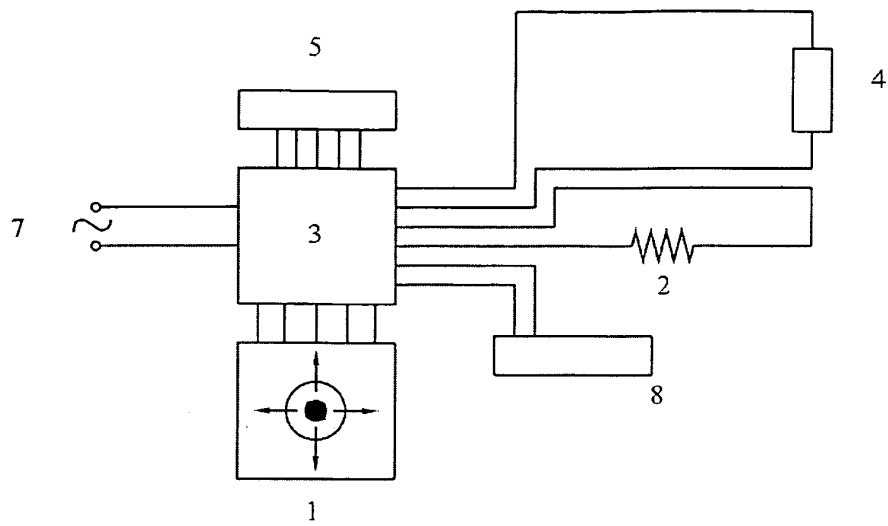


Fig. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2008/070661

A. CLASSIFICATION OF SUBJECT MATTER		
See extra sheet		
According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols)		
IPC: A45D1, A45D2, A45D4, A45D6, H01H15, H01H25		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)		
CNKI, CNPAT, WPI, EPODOC, PAJ: ION+, DISPLAY+, LCD, PDP, BUTTON+, KEY+, SWITCH+, CURL+, IRON+, TWIST+, THREE, DIMENSION+, DIFFERENT S DIRECTION?		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN1536968A (MATSUSHITA ELECTRIC WORKS CO LTD) 13 Oct. 2004 (13.10.2004) Page 5, line 20 to page 8, line 5, figs.1-3C	1-7
Y	CN2912334Y (JIANFU IND CO LTD) 20 Jun.2007 (20.06.2007) Page 3, line 18 to page 4, line 22, figs.1-8b	1-7
Y	CN2624685Y (Sun Zhiming) 14 Jul.2004 (14.07.2004) Page 3, line 3 to page 4, line 20, figs.1-2	1-7
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be of particular relevance "E" earlier application or patent but published on or after the international filing date "L" document which may throw doubts on priority claim (S) or which is cited to establish the publication date of another citation or other special reason (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "&" document member of the same patent family		
Date of the actual completion of the international search 28 Aug.2008 (28.08.2008)		Date of mailing of the international search report 11 Sep. 2008 (11.09.2008)
Name and mailing address of the ISA/CN The State Intellectual Property Office, the P.R.China 6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China 100088 Facsimile No. 86-10-62019451		Authorized officer YUAN, JIE Telephone No. (86-10)62085549

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2008/070661

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

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Form PCT/ISA/210 (continuation of second sheet) (April 2007)

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 Information on patent family members

International application No.

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2008/070661

A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classifications (IPC) or to both national classification and IPC

A45D 1/04 (2006.01) i

A45D 2/36 (2006.01) i

H01H 15/00 (2006.01) n

H01H 25/00 (2006.01) n

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