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(54) **Far infrared ray hair dryer**

(57) Disclosed is a far infrared ray hair dryer consists of a housing (2), a hand grip (3), an air inlet (21) and a wind outlet (24) respectively at one side. A fan motor (22)

equipped in the housing is for blowing the air, and a porous ceramic honey comb heater (4) installed in the housing is for radiating far infrared ray when heated and together with hot or cold wind to apply on the user's hair.

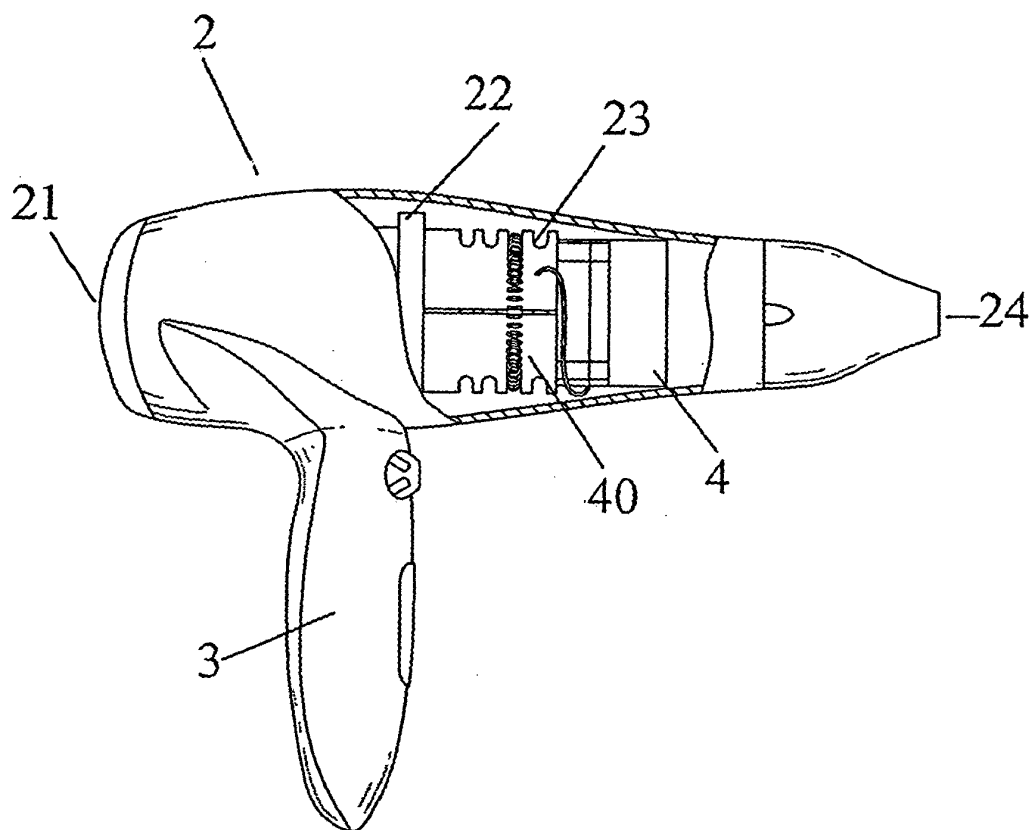


FIG. 3

Description

BACKGROUND OF THE INVENTION

1. Field of the invention

[0001] The present invention relates to far infrared ray hair dryer, and particularly, to a hair dryer which has a porous ceramic honey comb heater capable of emitting a far infrared ray out of its housing so as to dry the user's hair without hurting his/her hair.

2. Description of the prior art

[0002] The most essential purpose of a conventional hair dryer is to generate high temperature wind so as to dry the user's hairs efficiently. Its typical structure is shown as Fig.1. A tubular housing 10 has a wind exit 11 at one end, and an air inlet 13 covered with a filter net 12 at the other end. A fan motor 14 is equipped in the housing 10 near the air inlet 13 so as to draw in, and discharge the air out of the housing 10. A resistance coil unit is fastened around the inner edge of the housing at wind exit side to work as a heat generating unit 16 operable according to switching of a control switch 18 installed on the hand grip 17 and electrically connected to the heat generating unit 16 so as to output desired hot or cold wind with various intensity.

[0003] Actually, the aforesaid hair dryer is a high heat consumption electrical appliance simply containing a heater coil inside. In spite of the fact that it is able to adjust the wind temperature, wind intensity and operating time at ones will, unexpected overheating happens quite often which results in severe damage to the user's hair.

[0004] Incidentally, a conventional hair dryer often involves some unpleasant defects such as : 1. Hurting the user's hair, 2. bringing ret hot feeling to the user's head, 3. producing scorching oder, and 4. causing dizziness and headache to the user.

[0005] Other uncertain worries are: 1. radiation of extremely intensive electro-magnetic wave which is more than 20 times that a cellular phone generates, 2. significant tendency that beauticians and barbers prone to suffering from cataract, 3. teenagers' blood poisoning, 4. dizziness or weak-minded.

[0006] According to WHO Annual Report of 2001, the teenagers younger than 16 ages who are frequently exposed to radiation of electro-magnetic wave are prone to suffering from blood cancer with a probability 2.8 times than those who have never exposed under radiation of said wave. The US NIEHS, EPA organizations have tentatively established the maximum allowable value of the intensity of electro-magnetic wave as 2.0 gaussses after nine year study spending US\$. 65,000,000.

[0007] In view of the noticeable problems inherent to the conventional ohmic heat coil type hair dryer which should be overcome for the sake of the human health, the inventor has dedicated great efforts for years to stud-

ying and improving these defects and finally come up with this invention.

SUMMARY OF THE INVENTION

[0008] The main object of this invention is to provide a far infrared ray hair dryer which has a porous ceramic honey comb heater equipped in the front end of the housing near the wind exit to radiate far infrared ray after being heated. This far infrared ray wave is never hurt the human hair due to overheating, and this porous ceramic honey comb heater further can maintain a stable heating temperature, can be operated securely, and fabricated with a low cost.

[0009] The above object and other advantages of the present invention will become more apparent by describing in detail the preferred embodiment of the present invention with reference to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] For fuller understanding of the nature and objects of the invention, reference should be made to the following detailed description taken in conjunction with the accompanying drawings in which:

Fig. 1 is a partial sectional view of a conventional hair dryer.

Fig.2 is a perspective view of the present invention.

Fig.3 is a sectional view of the present invention.

Fig.4 is a three dimensional view of the porous ceramic honey comb heater of the present invention.

Fig.5 is a schematic view of the porous ceramic honey comb heater in another embodiment.

Fig.6 is a drawing showing operational principle of the present invention.

Fig.7 is a tablet of comparison of characteristics between the present invention and the conventional hair dryer.

Fig.8 is a graphical comparison about power consumption between the present invention and the conventional hair dryer.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0011] Referring to Figs.2 and 3, the hair dryer according to the present invention has a hollow tubular housing 2 including an air inlet 21, a fan motor 22, a bracket 23 with a porous ceramic honey comb heater 4 equipped on its front end, and a wind exit 24. The one end of the heater element 4 is connected to a circuit board (not shown) with a heater coil 40. As soon as the circuit is switched on and the comb heater 4 is heated by the heater coil 40 so as to radiate a far infrared ray, the hot or cold wind is blown out of the wind exit 24 together with the far infrared ray by the fan motor 22.

[0012] The porous ceramic honey comb heater 4 is

fixed on the bracket 23 with a metal ring (not shown) to which an electrode is attached to energize the metal ring. The honey comb heater 4 is then adhered around the outer side of the metal ring and the two ends of the heater element 4 are coated with an electrically conducting silica gel so that it can generate heat by introducing current from the metal ring. With this mechanism the porous ceramic honey comb heater 4 is heated up to a predetermined temperature so as to radiate a large amount of far infrared ray.

[0013] Alternatively, the honey comb heater 4 may be assembled to the metal ring of the bracket 23 with its outer edge, and connected to a metal ring at the other end, by so the ceramic honey comb heater 4 is sandwiched therebetween and allows the current to flow therethrough with the two metal rings serving as a couple of electrodes.

[0014] The porous ceramic honey comb heater 4 is a nano high technologic product fabricated by sintering process; it is able to radiate a far infrared ray with low power consumption yet a heat transformation rate as high as 95%.

[0015] The internal circuit of the hair dryer is controlled by a control switch provided on a side of the hand grip so that cold or wet wind can be outputted at different speeds as the user desires.

[0016] The ceramic heater 4 has an extra function to reduce the voltage rise so as to minimize the noise of the fan motor 22 when it rotates. The beehive configuration of the heater 4 is also possible to minimize its volume that leads to reduce the overall size of the hair dryer.

[0017] As shown in Fig.4, the porous ceramic honey comb heater 4 is integrally molded with material consisting of far infrared ray radiating substance and has proper number of axially laid square through holes 41 whose fillets are obtusely shaped so as to prevent creating acute portion inside the through holes 41 thereby increasing the mechanical strength of the structure. The entire structure of the ceramic honey comb heater 4 is further bound by a hoop 43 tightly to the bracket 23. Alternatively, the through holes 44 may be formed into a beehive type.

[0018] The operational principle of the present invention can be understood with reference to Fig.6. In Fig.6; sub-drawing(A) shows a water molecule w sticking to a hair molecule H; sub-drawing(B) shows the water molecule W is mingled with the hair molecule H; sub-drawing (C) shows water molecules W are scattered by radiation of the far infrared ray C; sub-drawing(D) shows the water molecules W scattered by far infrared ray C are more mingling with the hair molecules; and sub-drawing(E) shows the hair is now restored its brilliance and vividness.

[0019] The far infrared ray radiated by the ceramic honey comb heater 4 includes characteristic data as follows:

1. Extremely low electro-magnetic wave intensity below 2 gauss;
2. Wave length of the far infrared ray: 9 μm ;
3. High electrical efficiency: 33%

4. Negative ion creation: 5,000,000
5. No red hot feeling;
6. Never scorching the hair;
7. High hair drying speed.

[0020] The comparison of characteristics between the present invention and the conventional hair dryer is concluded in Fig.7, and the comparison of electrical efficiency between is express by graphs in Fig.8. Apparently the ceramic honey comb heater can radiate effectively far infrared ray to dry the user's hair effectively without any worry of possible damages, and the hair dryer can be fabricated easily, simply with a low cost. It is really a practical product.

[0021] Those who are skilled in the art will readily perceive how to modify the invention. Therefore, the appended claims are to be construed to cover all equivalent structures which fall within the true scope and spirit of the invention.

Claims

1. A far infrared ray hair dryer comprising:

A housing with a hand grip beneath it, and having an air inlet at one side, and a wind outlet at the other side;

A fan motor equipped inside said housing near said air inlet; and

A bracket equipped in said housing to fix electrical structures;

wherein a porous ceramic honey comb heater is fixed onto the front end of said bracket near said wind exit, said ceramic honey comb heater is for radiating a far infrared ray heating so as to cause the hot or cold wind blown out of said wind exit to contain far infrared ray to be applied on the user's hair.

2. The hair dryer of claim 1, wherein said porous ceramic honey comb heater contains a plurality of axially laid square through holes.
3. The hair dryer of claim 1, wherein said porous ceramic honey comb heater contains a plurality of beehive styled trough holes.
4. The hair dryer of claim 1, wherein said porous ceramic honey comb heater is connected to an electrical heater coil to enhance its heating effect.

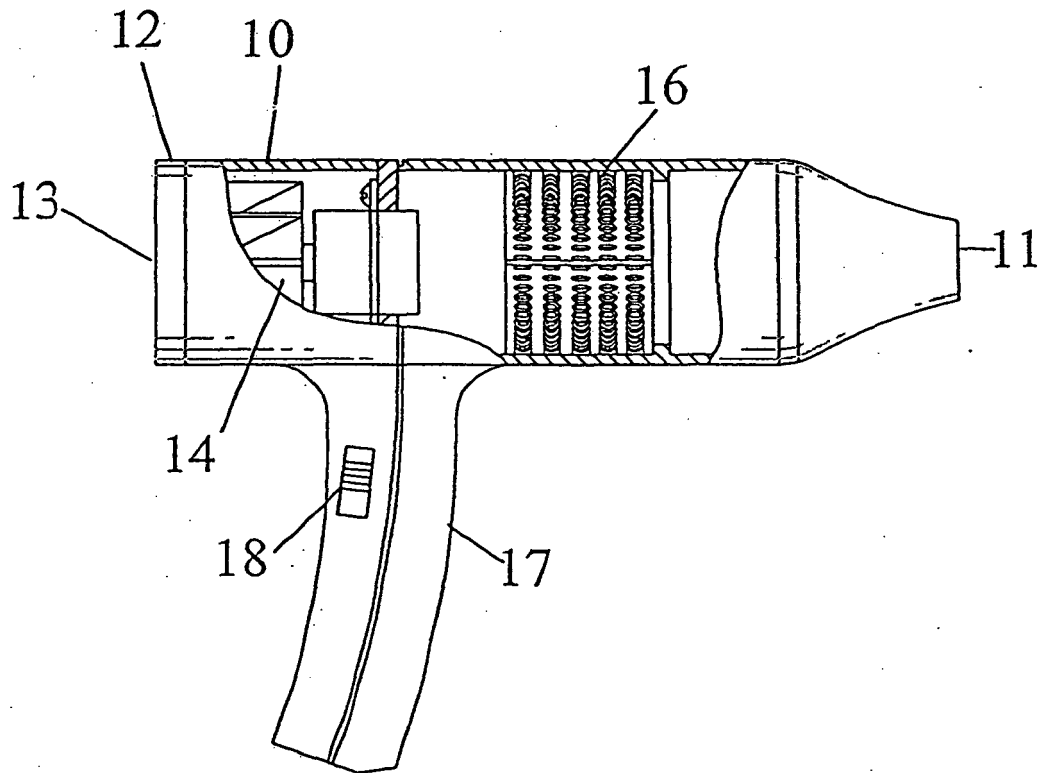


FIG. 1
(PRIOR ART)

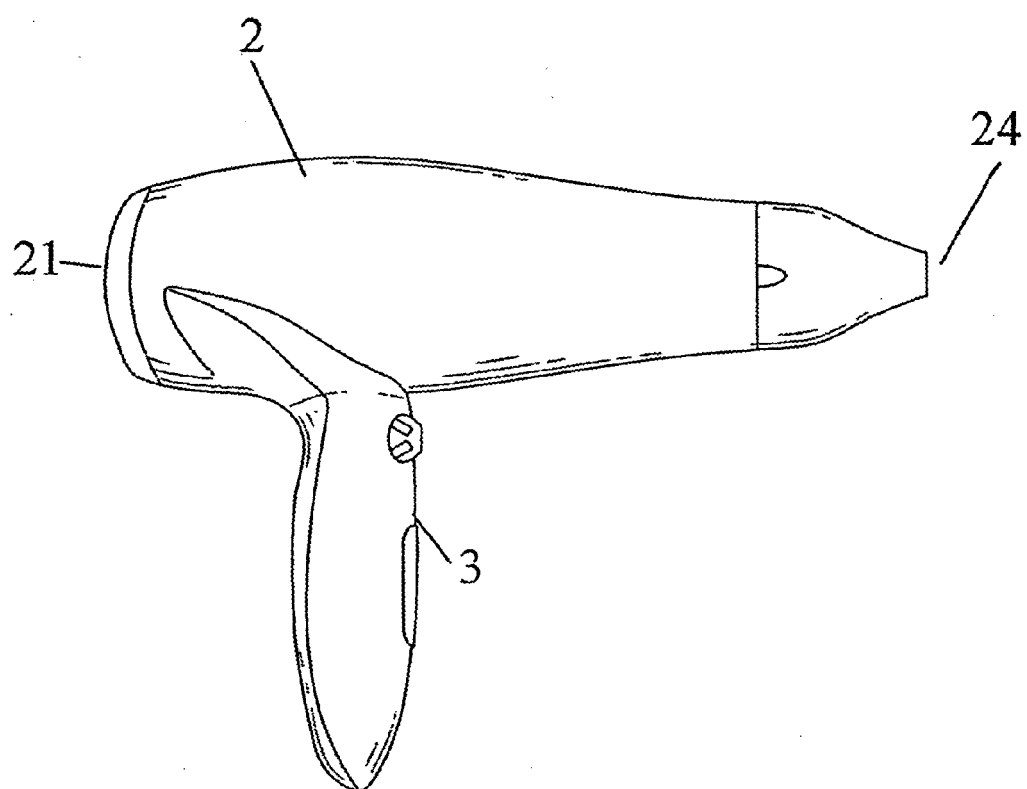


FIG. 2

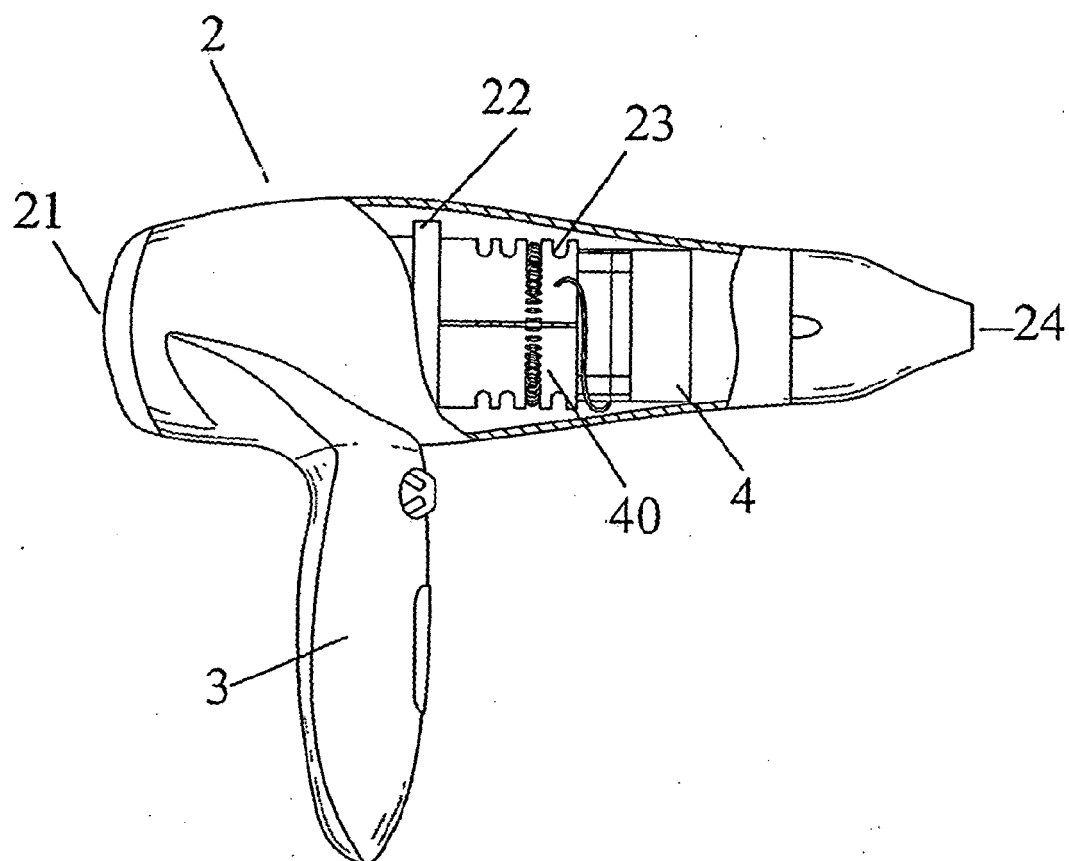


FIG. 3

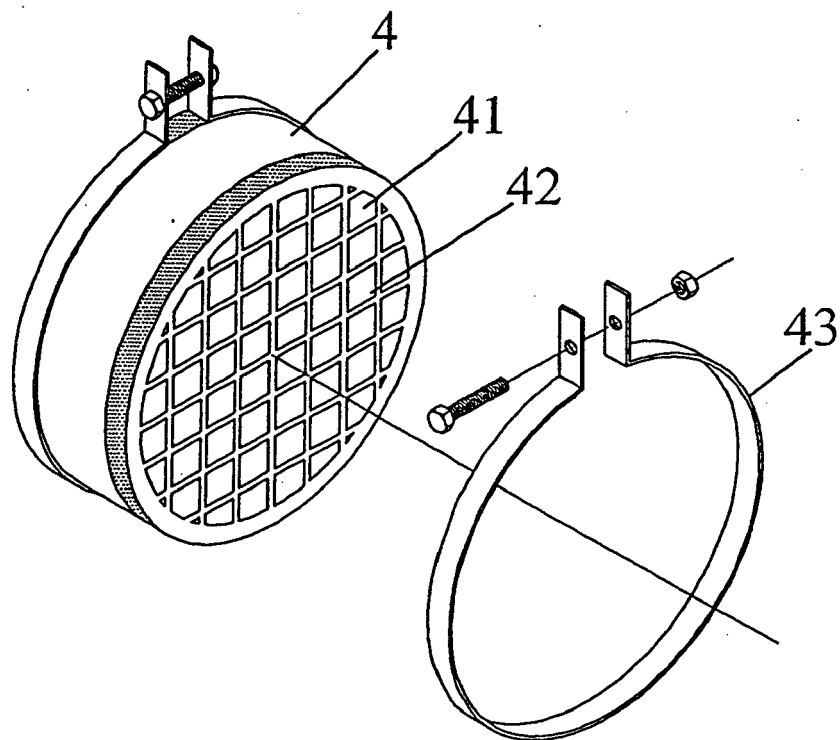


FIG. 4

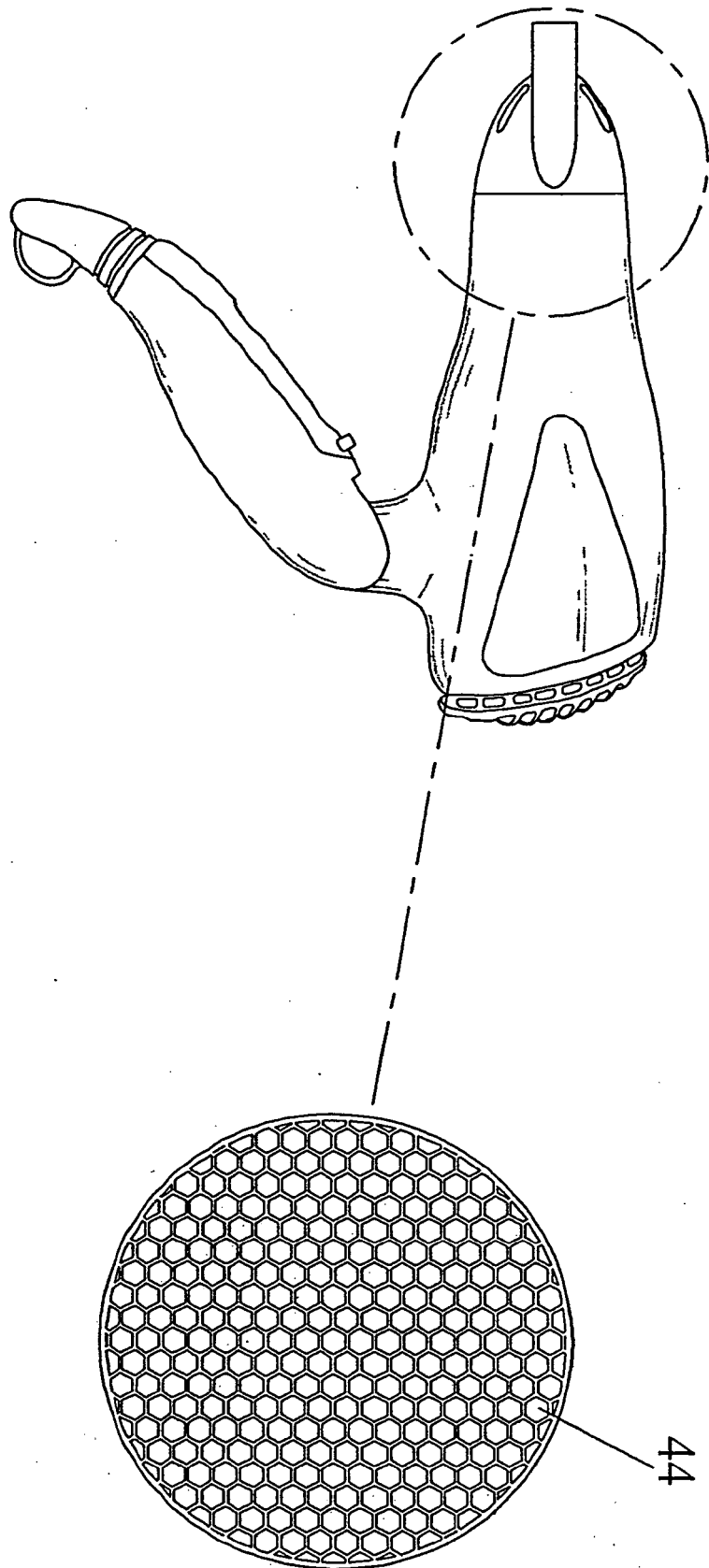


FIG. 5

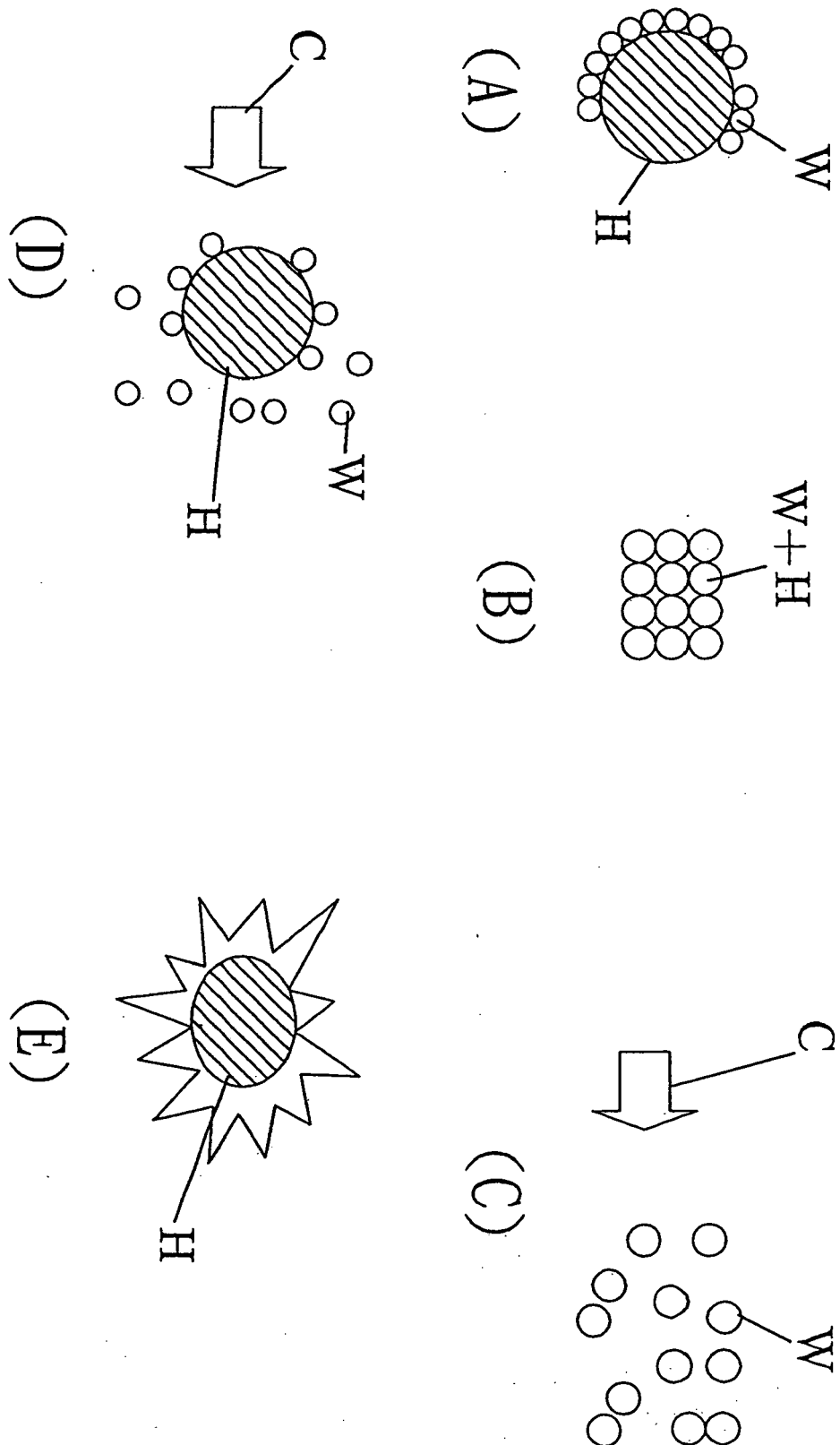


FIG. 6

Item	present invention	conventional product
heater element	100% ceramic heater	tungsten wire
strength of electro magnetic wave	under 2mG	530-700mG
far infrared ray	8-14μm wavelength (the closest to human body)	×
negative ion creation	5,000,000	▲
ani-electrostatic discharge	●	×
red hot felling	×	●
sorching odor	×	●
water preservation	●	×
hair drying speed	HI	LOW
activation of head skin	●	×
energy saving	33%	×

FIG. 7

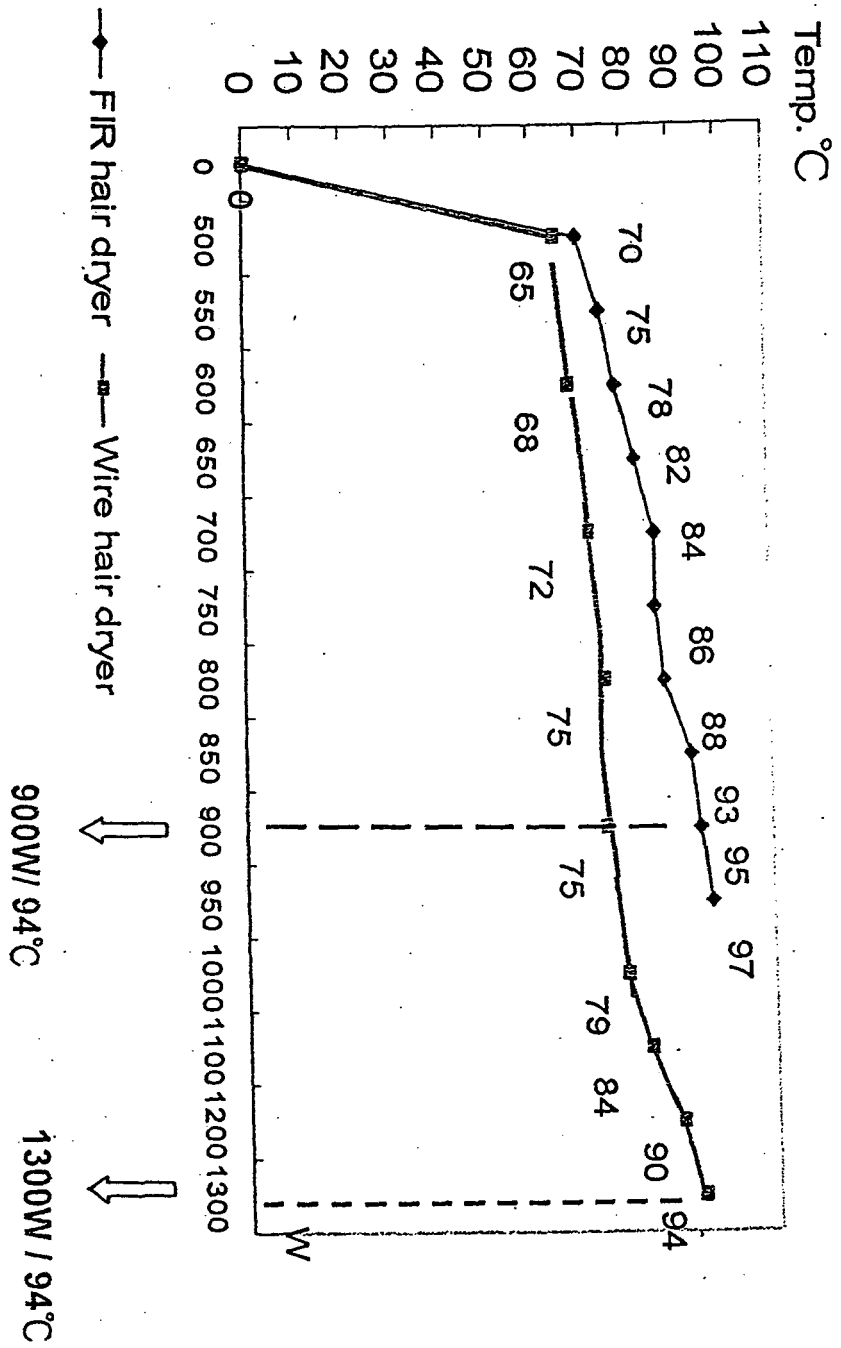


FIG. 8



European Patent
Office

EUROPEAN SEARCH REPORT

Application Number
EP 05 09 0016

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.7)
X	US 6 481 116 B1 (SLINGO FRED M) 19 November 2002 (2002-11-19) * column 1, line 30 - line 37 * * column 1, line 46 - line 50 * * column 2, line 27 - line 67; claims; figures * -----	1-4	A45D20/12
X	US 6 389 710 B1 (CHOU HSIU-FANG) 21 May 2002 (2002-05-21) * column 1, line 7 - line 10 * * column 1, line 27 - line 28 * * column 1, line 55 - line 60; claims; figures * -----	1-4	
X	US 2004/001707 A1 (RYU JAE-YOUNG ET AL) 1 January 2004 (2004-01-01) * paragraphs [0007] - [0016]; claims; figures * -----	1-4	
			TECHNICAL FIELDS SEARCHED (Int.Cl.7)
			A45D
The present search report has been drawn up for all claims			
Place of search Munich		Date of completion of the search 14 July 2005	Examiner Acerbis, G
<p>CATEGORY OF CITED DOCUMENTS</p> <p>X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document</p> <p>T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document</p>			

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EPO FORM 1503 03.82 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 05 09 0016

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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