



(12) **EUROPEAN PATENT APPLICATION**
published in accordance with Art. 153(4) EPC

(43) Date of publication:
17.07.2013 Bulletin 2013/29

(51) Int Cl.:
A45D 7/06 (2006.01)
A45D 7/00 (2006.01) **A45D 1/04** (2006.01)

(21) Application number: **10857038.3**

(86) International application number:
PCT/KR2010/007164

(22) Date of filing: **19.10.2010**

(87) International publication number:
WO 2012/033251 (15.03.2012 Gazette 2012/11)

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO RS SE SI SK SM TR

(72) Inventor: **Lee, Dae Bum**
Gyunggi-do 467-740 (KR)

(30) Priority: **06.09.2010 KR 20100086867**

(74) Representative: **Jones, Bruce Graeme Roland Hill Dickinson LLP**
Commerce & Technology
50 Fountain Street
Manchester Greater Manchester M2 2AS (GB)

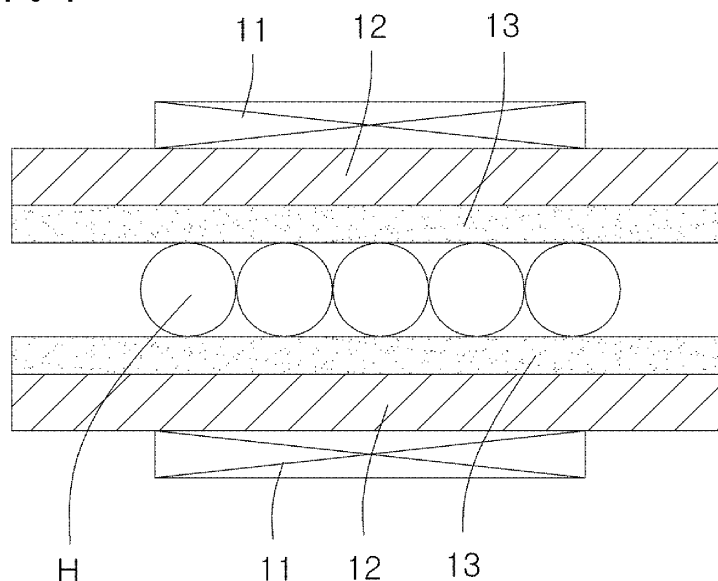
(71) Applicant: **Lee, Dae Bum**
Gyunggi-do 467-740 (KR)

(54) **HEAT TREATMENT METHOD FOR HAIR UPON WHICH COSMETIC CHEMICALS ARE APPLIED AND HAIR PROCESSING METHOD USING SAME**

(57) The present invention relates to the heat treatment which applies the heat energy to the hair to which the chemical has been already applied during the hair procedures such as perming or dyeing and the hair styling procedure using such method. It involves transferring the heat energy to the hair to which the chemical has been already applied by transferring heat to the metal member (12) of the electric heater (11) which has over 150kcal/m2 HCo heat transfer coefficient primarily and transferring heat to the non-metal member (13) with less than 0.20

kcal/m2 HCo heat transfer coefficient secondarily. The procedure is characterized by the heat transfer by the contact between the above-mentioned non-metal member and the hair (H) for the heat treatment method on the hair to which the chemical has already been applied. Also, it provides various hair styling methods where a high temperature heat is applied to the hair(H), making the main ingredient of the hair (H), keratin react to the heat and relaxes while the hair swells, allowing more active penetration and escaping of the dye.

[Fig. 1]



Description

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims priority to PCT/KR2010/007164, filed on October 19, 2010, which claims priority to KR 10-2010-0086867, filed on September 6, 2010, the disclosures of the both which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] The present invention relates to a hair heat treatment apparatus so that heat energy is applied to a chemical applied hair for hair treatment procedures such as perming or dyeing hair. The present invention additionally relates to a hair treatment procedure using the hair heat treatment apparatus.

[0003] Various procedures such as perming, dyeing and bleaching hair are being performed at a place like a hair salon. Here, such procedures will be referred to as a hair treatment procedure or hair treatment method. For the hair treatment procedures, various chemicals are applied to hair. For instance, such chemicals include perm chemicals, bleach, dye or nourishments. The chemicals are manufactured in the form of gel or liquid in order for them to be applied evenly to the surface of hair having very small diameters and usually containing moisture.

[0004] It is very well known that the chemicals in the form of gel or liquid more effectively permeate hair tissue if heat energy is applied because heat improves the mobility of the chemical particles. Apparatuses to provide heat energy to hair include a hand-held electric hair dryer which is manually held by a hand to blow hot air to the hair, a rotating hair dryer which emits heat energy to and around the hair as shown in Korea Utility Model Patent Numbers KR 20-0131822, KR 20-0167285, and KR 20-0319890, and an electric hair iron which directly transfers heat energy to the hair by its direct contact with the hair. Applying heat energy to the hair using devices such as a hand-held hair dryer or a rotating hair dryer may be called as an indirect heat treatment method whereas using devices such as an electric hair iron may be called as a direct heat treatment method.

[0005] Using a hand-held hair dryer as a device to provide heat energy to chemical applied hair during the hair treatment procedures is not appropriate because the hair is blown by hot air and it is impossible to treat all hair evenly heat treated at a certain temperature. Thus, a hand-held dryer is not proper to be used to chemical applied hair for a sound hair treatment procedure and it was never tried as a tool to provide heat to chemical applied hair.

[0006] Using an electric hair iron to provide heat to chemical applied hair also has a problem. An electric hair iron has a metal plate which receives heat energy from the heater of the electric hair iron and transfers the heat energy to hair. If the metal plate is in direct contact with

chemical applied hair, steam explosion may occur as in FIG. 12 because of the chemical's direct contact with the metal plate. Such steam explosion makes hair treatment procedure impossible.

[0007] In other words, the above-mentioned metal plate receives heat energy from the electric heater and metal has a great heat transfer coefficient because in case of metal, heat transfer or heat conductivity is done by free electrons. The greater the heat transfer coefficient, the faster the heat transfer from the electric heater to the surface of the metal plate in direct contact with the metal plate.

[0008] While the amount of chemical applied to hair is small, great heat energy from the electric heater is continuously transferred to the surface of the metal plate, the small amount of chemical getting instantly heated and causing the steam explosion. Therefore, the electric hair iron cannot be used when the hair is wet or the chemical is already applied to the hair, and it can be used only when the hair is dry, transferring heat to the hair.

[0009] Therefore, the conventional art only depends on the indirect heat treatment, using a rotating hair dryer, an electric lamp or a steamer to radiate heat energy to hair. In case of indirect heat treatment, if heat energy is continuously emitted to a certain direction, the chemical may be burnt or evaporated, and thus, the heater lamp has to be rotated to prevent such problem. However, the heat energy cannot be evenly applied to the entire hair and thus, there is a problem of uneven heat treatment, leading to the problems of unsatisfactory perms and remaining stains after dyeing. Besides, it takes a lot of time for the heat treatment because heat radiation is used instead of heat conductivity.

[0010] In case of the indirect heat treatment, if the heat energy of high temperature is used to hair to which a chemical has already been applied, the chemical gets evaporated or burnt. So the hair has to be treated at a relatively medium temperature of 40-50°C. As a result, when straightening or perming the hair for the procedure, after the hair is completely dried, additional hair treatment has to be performed using an electric hair iron or the like at a high temperature.

[0011] Therefore, it takes a lot of time to perform a hair treatment procedure and when heat energy of a high temperature is applied to dry hair, the moisture contained in the hair tissue evaporates, causing damage to the hair.

[0012] Besides, only highly skilled person having a lot of experiences can perform sound hair treatment procedures and a low skilled person has to pay a lot of attention to prevent damage to hair.

SUMMARY OF THE INVENTION

[0013] The object of the present invention is to provide a hair heat treatment apparatus which directly transfers heat to hair to which chemical has been applied and hair treatment procedures using the apparatus.

[0014] Still another object of the present invention is

to make the hair procedure speedy and prevent damage to hair during the hair treatment procedure so that even unskilled person can perform a satisfactory procedure.

[0015] The apparatus of the present invention transfers heat energy to hair to which chemical has been applied for the preparation of a hair heat treatment wherein an electric heater of the apparatus transfers heat energy to a metal member having the heat transfer coefficient of $150\text{kcal/m}^2\text{H}^\circ\text{C}$ and then, the heat energy of the metal member is transferred to a non-metal member having the heat transfer coefficient of $0.20\text{ kcal/ m}^2\text{H}^\circ\text{C}$ or less in that the non-metal member is to be in contact with hair (H) to transfer heat energy to the hair (H).

[0016] The apparatus further comprises a pair of pressing plates to one of which an electric heater, a metal member and a non-metal member are attached so that the hair is pressed in between a pair of the non-metal members for heat energy transfer to the hair.

[0017] The metal member may be made of stainless steel or aluminum and the non-metal member may be made of heat-resistant rubber or plastic.

[0018] A hair treatment method of the present invention to repair damaged hair comprises chemical application process which applies the protein nourishment to the folds of hair surface after shampooing the hair; first direct heat treatment process which divides the hair into 1-3cm sections, each section of which is inserted between a pair of pressing plates to be pressed and slid down slowly towards the hair tips for allowing the transfer of heat energy to the section of hair, and repeats the insertion, pressing and sliding down process 2-3 times; cleansing and towel-drying process which cleanses the hair with water and towel-dries the hair to remove water; second direct heat treatment process which involves repeating the first direct heat treatment step 3-4 minutes after applying the protein coating agent to the hair, wherein the electric heater has the temperature of $100\text{-}120^\circ\text{C}$ and the heat energy of the electric heater transfers to the metal member and then to the non-metal member, a pair of the non-metal members pressing against the hair for transfer of heat energy to the hair.

[0019] Another hair treatment method of the present invention to straighten curly hair comprises first chemical application process which involves shampooing curly hair and applying the perm chemical to the surface of curly hair; direct heat treatment process which includes dividing the hair into 1-3cm sections, each section of which is inserted between a pair of pressing plates to be pressed and slid down slowly towards the hair tips for allowing the transfer of heat energy to the hair, and repeats the insertion, pressing and sliding down process 2-3 times; second chemical application process which involves applying to the hair the protein balancing agent and then neutralizer, and leaving it for 10-15 minutes; and the process of cleansing the hair with water.

[0020] The hair treatment method to straighten curly hair may further comprise the process of dividing the hair into sections of 1-3cm, each section of which is inserted

between a pair of pressing plates to be pressed and slid down slowly towards the hair tips for allowing the transfer of heat energy to the hair between the first chemical application process and the direct heat treatment process, wherein the electric heater has the temperature of $80\text{-}100^\circ\text{C}$ and the heat energy of the electric heater transfers to the metal member and then to the non-metal member, a pair of the non-metal members pressing against the hair for transfer of heat energy to the hair.

[0021] In the direct heat treatment process, the temperature of the electric heater may be around $80\text{-}100^\circ\text{C}$ for the case of extremely damaged hair, $110\text{-}130^\circ\text{C}$ for the case of mildly damaged hair, and $140\text{-}200^\circ\text{C}$ for the case of healthy hair.

[0022] Still another hair treatment method of the present invention for pressing coating of the hair surface comprises first chemical application process which involves shampooing the hair and applying protein treatment agent to the hair; dividing the hair into 1-3cm sections, each section of which is inserted between a pair of pressing plates to be pressed and slid down towards the hair tips, and repeats the insertion, pressing and sliding down process 2-3 times, wherein the temperature of the electric heater is set to $100\text{-}120^\circ\text{C}$; second chemical application process which involves cleansing the hair with water, towel-drying it to remove water and applying pressing coating agent to form the coating layer on the hair surface, waiting for 9-11 minutes before the beginning of next process; second direct heat treatment which includes dividing the hair into 2-6cm sections, each section of which is inserted between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of $120\text{-}160^\circ\text{C}$, having a pair of non-metal members to press each section of the hair while sliding down slowly towards the hair tips for allowing the transfer of heat energy to the hair and repeats the insertion, pressing and sliding down process 2-3 times; waiting for 9-11 minutes; third direct heat treatment which involves cleansing the hair, applying the protein coating agent and repeating the same process as the second direct heat treatment process; and the hair procedure which includes cleansing hair.

[0023] Still another hair treatment method of the present invention for dyeing the hair comprises first chemical application process which involves shampooing the hair, mixing 90 weight % of the mixture of dyes and oxidizer and 10 weight % of treatment and applying it to the hair; first direct heat treatment which includes dividing the hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of $120\text{-}160^\circ\text{C}$, having a pair of non-metal members to press each section of the hair to be pressed and slid down towards the hair tips to transfer the heat energy to the hair, repeating the pressing and sliding down process for 2-3 times; waiting for 9-11 minutes; balancing process which involves

applying the protein balancing agent to the hair, thereafter waiting for 3 minutes and cleansing the hair with shampoo; applying the protein treatment to the hair and thereafter, second direct heat treatment which repeats the same process as the first direct heat, thereafter waiting for 3 minutes; and cleansing and washing the hair.

[0024] Still another hair treatment method of the present invention for bleaching the hair comprises first chemical application process which involves shampooing the hair, mixing the primary dye remover and the secondary dye remover in 1:1 ratio, applying it to the hair, and waiting for 10-30 minutes; first direct heat treatment which includes dividing the above-mentioned hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 130-160°C, having a pair of non-metal members press each section of the hair to be pressed and slid down slowly towards the hair tips for allowing transfer of heat energy to the hair, repeating the insertion, pressing and sliding down process for 2-3 times; second chemical application process which involves applying protein treatment to the hair, cleansing the hair with alkaline shampoo and drying the hair, and applying protein treatment to the hair; second direct heat treatment which involves dividing the hair into 2-6cm sections, inserting each section of the hair into a pair of the pressing plate having the electric heater of 100-120°C, having a pair of the non-metal members press the hair while pressing the section of the hair and sliding down slowly towards the hair tips for allowing transfer of heat energy to the hair, repeating the insertion, pressing and sliding down process for 2-3 times; third direct heat treatment which involves applying protein coating to the hair and repeating the second direct heat treatment; and cleansing the hair.

[0025] Still another hair treatment method of the present invention for removing pressing coating layer on the hair surface comprises first chemical application process which involves shampooing the hair, mixing the coating remover and treatment in 50:50 ratio to be applied to the hair and waiting for 10-30 minutes; first direct heat treatment which includes dividing the hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 100-130°C, having a pair of the non-metal members press the hair and slide down slowly towards the hair tips for allowing transfer of heat energy to each section of the hair, repeating the insertion, pressing and sliding process for 2-3 times; washing the hair with alkaline shampoo and applying protein treatment to the hair, and second direct heat treatment which repeats the same process as the first direct heat treatment; and cleansing and washing the hair.

[0026] Still another hair treatment method of the present invention for bleaching the hair comprises first chemical application process which involves shampoo-

ing the hair, drying it and the scalp protection process where the scalp protector is applied; first chemical application process which involves mixing the bleaching, oxidizing agents and the treatment and applying the mixture to the hair; first direct heat treatment which includes dividing the hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 100-120°C, having a pair of non-metal members press the hair and slide down slowly towards the hair tips for allowing transfer of heat energy to each section of the hair, repeating the insertion, pressing and sliding process for 2-3 times; balance process which includes applying protein balancing agent to the hair, waiting for 2 minutes and washing the hair with shampoo; the second heat treatment which includes applying protein treatment to the hair and repeating the same process as the first direct heat treatment; cleansing and washing the hair.

[0027] Still another hair treatment method of the present invention for promoting the softening of the hair and perming the hair with the perm rods comprises first chemical application process which includes shampooing the hair, towel-drying the hair to remove water and applying perm chemical to the hair; direct heat treatment which includes dividing the hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 100-130°C, having a pair of the non-metal members press the hair and slide down slowly towards the hair tips for allowing transfer of heat energy into each section of the hair, repeating the insertion, pressing and sliding process for 2-3 times; second chemical processing which includes applying neutralizer to the hair, winding the hair to the perm rods and waiting for 10-15; processes of acidic rinsing, removing the perm rods, and washing the hair with shampoo.

[0028] Still another hair treatment method of the present invention for straightening curly hair by degeneration of protein in the hair comprises first chemical application process which involves shampooing the hair, drying the hair and applying protein nourishment to the hair; direct heat treatment which includes dividing the hair into 2-5cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 100-130°C, having a pair of the non-metal members press the hair and slide down slowly towards the hair tips for allowing transfer of heat energy to each section of the hair, repeating the insertion, pressing and sliding process for 2-3 times; second application process which includes drying the hair with hot air and applying protein coating to the hair; second heat treatment which repeats the same process as the first direct heat treatment; sliding each section of the hair between a pair of hot plates of the electric hair iron for degenerating the protein in the hair at a high temper-

ature; waiting for 72 hours and cleansing and washing the hair with shampoo.

[0029] The present invention provides an apparatus which directly transfers heat energy to the hair to which a chemical has already been applied. Thus, the present invention makes possible various new hair treatment methods or procedures which even unskilled persons can easily perform. With the apparatus of the present invention, hair treatment procedures can be fast done and the damage to hair does not occur during the procedures, leading to a satisfactory result.

BRIEF DESCRIPTION OF THE DRAWINGS

[0030] These and other features, aspects and advantages of the present invention will be better understood with reference to the accompanying drawings, wherein:

FIG. 1 shows a cross-sectional view of the present invention;

FIG. 2 shows an embodiment of the present invention;

FIG. 3 shows another embodiment of the present invention;

FIG. 4 shows a diagram to show describe a method for repairing damaged hair according to the method of the present invention;

FIG. 5 shows photos of damaged hair and repaired hair according to the method of the present invention;

FIG. 6 shows a brief diagram to explain the straightening procedure of the present invention;

FIG. 7 shows the state of hair to which a conventional straightening method is performed;

FIG. 8 shows a diagram to explain the straightening procedure of the present invention;

FIG. 9 shows the state of hair straightened from curly state after the straightening procedure of the present invention;

FIG. 10 shows a concept for the procedure of the present invention for the pressing coating layer;

FIG. 11 shows photos of the states of hair showing before and after the straightening of curly hair procedure of the present invention; and

FIG. 12 shows the explosion of moisture occurring when the existing electric hair iron is used to hair having moisture.

DETAILED DESCRIPTION EMBODIMENTS OF THE INVENTION

[0031] As in FIG. 1, the present invention provides an apparatus for transferring heat energy to the hair (H). Heat energy generated by the electric heater 11 is transferred to the metal member 12, having the heat transfer coefficient of $150\text{kcal/m}^2\text{H}^\circ\text{C}$ or more, and the heat energy of the metal member 12 is sent to the non-metal member 13, having the heat transfer coefficient of $0.20\text{kcal/m}^2\text{H}^\circ\text{C}$ or less. The heat treatment method uti-

lizes transfer of the heat energy from the non-metal member 13 to hair (H) by their direct contact with each other.

[0032] As in FIGS. 2 and 3, the apparatus of the present invention comprises a pair of pressing plates 14, 14', the electric heaters 11, metal members 12, and non-metal members. Each of the pressing plates 14, 14' has the electric heater 11 which is contacted or connected to the metal member which in turn is in contact with the non-metal member 13 so that heat energy generated from the electric heater 11 flows to the metal member 12 and then to the non-metal 11. The pair of pressing plates 14, 14' are configured to allow the non-metal members 13 to press hair (H) in between for the transfer of heat energy from the non-metal members 13 to the hair (H).

[0033] As shown in one embodiment of FIG. 2, the apparatus is configured in the pressing plates 14, 14' are separated by an elastic member 15. By holding and pressing the pressing plates 14, 14', the pressing plates 14, 14' can come close and in contact with each other, allowing a pair of the non-metal members 13 to press the hair (H) for the transfer of heat energy.

[0034] FIG. 2 shows another embodiment of the apparatus. The pair of pressing plates 14, 14' are kept apart by a pair of elastic members 15, 15' on both ends of the pressing plates 14, 14'. By holding and pressing the pressing plates 14, 14', the non-metal members 13 can press the hair (H) in between them for the transfer of heat energy.

[0035] Here, the present invention is characterized by heat energy that is generated by the electric heater 11, being transferred to the metal member 12 and then to the non-metal member 13, allowing the transfer of heat energy by direct contact between the non-metal member 13 and the hair (H). Therefore, it does not depend on the specific shape of the pressing plates 14, 14'.

[0036] Also, the heat transfer occurs by the non-metal member 13 in contact with the hair (H). Therefore, the non-metal member 13 should be preferably attached to the outside surface of the metal member 12. The non-metal member 13 may surround substantially the entire metal member 12 and the electric heater 11 for the transfer of heat energy to the hair (H). While the non-metal member 13 surrounds the outside surface of the metal member 12, it may additionally surround substantially the entire surface of the pressing plate 14.

[0037] The electric heater 11 is already well known in the art and thus, its detail, temperature control and connection to electric cords or switch are omitted.

[0038] The metal member 12 has a relatively high heat transfer coefficient. Aluminum has the heat transfer coefficient of $229\text{kcal/m}^2\text{H}^\circ\text{C}$ and copper has the heat transfer coefficient of $386\text{kcal/m}^2\text{H}^\circ\text{C}$, both of them being relatively high heat transfer coefficient. As the heat transfer coefficient of the metal member 12, the heat transfer coefficient of $150\text{kcal/m}^2\text{H}^\circ\text{C}$ or more is generally good for heat transfer.

[0039] When the metal member 12 with a relatively high heat transfer coefficient receives the heat energy

from the electric heater 11, the heat transfer occurs by the free electrons due to the properties of metals. Since the heat transfers rapidly to the external surface of the metal member 12, heating occurs in a speedy manner.

[0040] Besides, the non-metal member 13 is weak in strength and thus, the metal member 12 plays the role of supporting and maintaining the form of non-metal member 13. It is preferable that metals such as aluminum or stainless steel are used for the metal member 13.

[0041] The non-metal member 13 has a very low heat transfer coefficient. The non-metal member 13 may be made of rubber having the heat transfer coefficient of 0.15 kcal/m²H°C, acryl having 0.51-0.37 kcal/m²H°C, wood having 0.21-0.4 kcal/m²H°C, or paper having 0.02-0.15 kcal/m²H°C.

[0042] Therefore, when the non-metal member 13 receives heat energy from the metal member 12, the heat energy does not rapidly transfer. The heat energy transfers slowly from the side of the non-metal member 13 in contact with the metal member 12 to the other side of the non-metal member 13, and thus the non-metal member 13 retains latent heat energy.

[0043] Then, the latent heat energy is transferred to the hair (H) and the hair (H) receives the heat energy. Therefore, if the non-metal member 13 with latent heat energy is in contact with the liquid, the liquid receives the heat energy in the form of latent heat energy, and due to liquid's physical properties, liquid does not instantaneously evaporate. Moreover, the liquid gets the latent heat of the non-metal member 13 which comes in contact with the liquid, the latent heat from the outside surface moves towards the liquid. The temperature becomes a bit lower than the temperature inside the non-metal member 13 which comes in contact with the metal member 12.

[0044] Here, non-metal member 13 has a low heat transfer and the heat energy inside does not get transferred fast to the outside surface. The liquid does not get the heat energy of a high temperature rapidly and receives the heat energy from the latent heat. Then, the liquid does not get heated instantly and thus, water does not evaporate explosively.

[0045] This invention transfers heat while moving from the top of the hair (H) to the hair tips rather than transferring heat from one location of the hair (H) with the non-metal member 13 in direct contact with the hair (H) when the chemical has been already applied onto the surface. Thus, the chemical does not burn nor evaporate instantly, transferring the heat energy.

[0046] In the present invention, the heat energy can be applied directly to the hair (H) to which the chemical has been already applied, making the procedure possible and hair heat treatment plausible.

[0047] Therefore, it is advisable to use the non-metal members 13 of 0.20 kcal/m²H°C or less heat transfer coefficient. Since it directly is in contact with the chemical, it is advisable to use the rubber of plastics with heat resistance, fire-resistance, weather-proof, oil-resistance and high elasticity but depending on the case, other types

of non-metals can be used.

[0048] Hair procedure using the heat treatment method to the hair to which the chemical has been already applied can be explained as follows.

5 [0049] The chemicals used in the hair procedure by this invention are already known. Therefore, the detailed explanations on the ingredient and mixing ratio are omitted.

10 [0050] FIGS. 4 and 5 shows the procedure to repair damaged hair.

[0051] The hair comprises hair cortex, hair medulla and hair cuticle. Its main ingredient is 80-90% protein containing the sulphur called keratin. The rest of the components include melanin, structures, moisture and microelements.

15 [0052] Hair gets damaged from factors such as frequent perms, dyeing and constant drying and combing, making it porous hair and the procedure repairs such damaged hair.

20 [0053] In such case, the first stage, chemical application process is performed after shampooing the hair and applying protein nourishment on the surface of the hair.

25 [0054] Therefore, as shown in FIG. 4(a), the protein nourishment (p) is applied to the damaged parts of the hair (H).

[0055] Then, for the second stage, the first direct heat treatment includes dividing the above-mentioned hair into 1-3cm sections, inserting the hair between a pair of pressing plates 14, 14' with the non-metal member 13 affixed to the metal member 12 that receives heat energy from 100-120 °C of the electric heater, having a pair of non-metal members 13 press the hair while sliding down slowly towards the hair tips to allow the transfer of heat energy to the hair for the procedure to be repeated 2-3 times.

30 [0056] Since, as shown in FIG. 4(b), hair (H) gets the heat energy of a high temperature around 100-120 °C, the hair swells and relaxes while the liquidity of the protein nourishment becomes active, allowing the deep penetration of protein nourishment (p) made up of keratin into the hair (H).

35 [0057] Then, for the third stage, the cleansing and drying process which involves washing the above-mentioned hair and towel-drying it to remove excess water. The fourth stage, the second direct heat treatment involving the application of protein coating to the above-mentioned hair and performing the process identical to the above-mentioned first direct heat treatment after 3-4 minutes is carried out.

40 [0058] Thus, the protein coating agent (c) constitutes the outer layer as shown in FIG. 4(c) for the damaged hair (H), making the hair (H) thicker with a better texture. The damaged parts get filled with protein nourishment (p), repairing the damaged hair (H) to healthy hair (H).

45 [0059] To help the understanding of this invention, in the past, the procedures which repair hair using the protein nutrients and coating agent were attempted. However, since the heat energy could be applied only by in-

direct heat treatment to the hair, emitting only about 45-60 °C heat energy to the hair, it takes a long time for hair cuticles to swell. Also, the protein treatment does not penetrate deep into the cuticle layer inside the hair and the protein degeneration does not occur, not allowing the protein to bond to the hair and making it not sustainable.

[0060] However, this invention's second stage, the first direct heat treatment allows the direct heat to be transferred to the hair (H), applying the heat energy of 100-120 °C to the hair (H).

[0061] Therefore, when 100-120 °C of heat energy is applied to the hair, the hair (H)'s main ingredient, keratin responds to the heat and relaxes, making the hair (H) swell at the same time.

[0062] Also, the treatment, protein nourishment (p)'s main ingredient, keratin becomes activated, allowing it to be penetrated deep into the relaxed and swollen hair (H) tissue. Furthermore, when the hair (H) swells, the porous holes in the hair (H) widens, making them absorb and the protein nourishment (p) gets absorbed into the damaged holes.

[0063] Thus, when the hair (H) is damaged, the protein nourishment (p) penetrates deep into the porous holes to mutually react with the hair tissue, forming stronger peptide bonds and enhancing the staying power of the protein nourishment (c) to stick to the hair (H).

[0064] Also, this invention applies the direct heat of 100-120 °C to the hair for the third stage, the second direct heat treatment after the protein coating (c) forms the protective layer on the hair to repair the outer layer of the damaged hair, making it to stick to the hair (H) surface and sustain for a long time. When protein of the above-mentioned protein coating(c) gets the heat energy of a high temperature, it becomes hardened and sticks well, providing the instant heat energy of a high temperature.

[0065] FIGS. 5(a) and 5(b) show dry and damaged hair. FIG. 5(c) shows damaged hair where the cuticles are separated and FIG. 5(d) shows the damaged hair which became healthy by the procedure from this invention.

[0066] Thus, the invention raises the penetration and absorption when repairing the damaged hair and protein forms the bond with the hair, greatly improving the staying power of protein nourishment (p) to remain continuously.

[0067] As for the hair procedure which involves inserting hair into a pair off the pressing plates 14, 14' and having a pair of non-metal members 13 to press the hair while sliding down slowly towards the hair(H) tips to allow the transfer of heat energy to the hair, based on 20cm hair length, the speed for sliding down from the top of the hair to hair tips at the bottom is to take about 10 seconds, slowly moving the pressing plate 14, 14'.

[0068] For a pair of pressing plates 14, 14"s non-metal members 13 to press the hair while sliding down slowly towards the hair (H) tips to allow the transfer of heat energy to the hair, as for the speed for pulling down the pressing plate 14, 14', it is the same for other hair pro-

cedures and thus, the details for this will be omitted.

[0069] Also, for another procedure using the intention, straightening of curly hair will be explained in reference to FIGS. 6 and 7.

[0070] However, to help the understanding of this invention, the previous procedures will be briefly explained in reference to Figure 6. In other words, in the past as shown in FIG. 6(a), the first agent, chemical was applied to the curly hair right after shampooing and the indirect heat treatment of 40-50 °C was performed The hair swells and the reducing agent cuts the SS bond as shown in FIG. 6(b), washing the perm chemical and completely dry the hair (H) with the dryer.

[0071] Also, the hair dried by the electric hair iron, receives the heat energy of 180-200 °C to straighten the hair straight as shown in FIG. 6(c). Then the second agent, neutralizer is applied to reconnect the SS bonds, but in this case, the hair(H) dried with the electric hair iron is given 180-200 °C heat energy, the moisture within the hair (H) evaporates, degenerating the protein which is the main ingredient of the hair(H) hair (H)'s cuticles become flat as shown in FIG. 7(a) and the procedure ends up with the hair being completely flat as shown in FIG. 7(b). Also, the moisture within the hair tissue gets evaporated, damaging the hair. But, this invention allows the procedure where the hair is not damaged as previously and offers the procedure which straightens curly hair without making it flat.

[0072] Thus, this invention is for straightening curly hair. First, after shampooing the curly hair, the first stage, the application of the first chemical where the perm chemical is applied on the surface of curly hair begins.

[0073] For this invention, depending on the state of the hair, the second stage, the hair softening processing can be carried out or it can be omitted. So, it is the process which can be selected depending on the state of the hair.

[0074] In other words, the hair can be classified into the extremely damaged hair, damaged hair, healthy hair and bristle hair. In case of the bristled hair, the perm chemical applied to the hair in the first stage is to be washed and after the hair gets softened, the perm chemical is applied again as in the case of the first stage. When there is moisture in the hair, the second stage, hair softening processing is performed.

[0075] Above-mentioned hair softening processing involves dividing hair to which the above-mentioned perm chemical has been applied into 1-3cm section as shown in FIG. 3, inserting them between a pair of the pressing plate which has the non-metal member affixed to the metal member that receives the electric heat energy from 80-100 °C of electric heater, having a pair of non-metal members 13 press the hair while sliding down slowly towards the hair tips to allow the transfer of heat energy to the hair.

[0076] Above-mentioned hair softening processing starts, the hair receives heat energy of high temperature, increasing the swelling and perm chemical's liquidity, enhancing the penetrability of the perm chemical which

does not easily penetrate into the bristle hair more speedily and a satisfactory procedure can be performed.

[0077] Then, the third stage, the direct heat treatment process is performed after the first stage is over and thus, it is carried out when the perm chemical is applied to the hair.

[0078] Thus, the above mentioned hair is divided into 1-3cm sections and as shown in FIG 2, the hair is inserted into a pair of pressing plates 14, 14' with the non-metal member 13 affixed to the metal member 12 which receives the heat energy of the electric heater 11 and have a pair of non-metal members 13 press the hair while sliding down slowly towards the hair tips to allow the transfer of heat energy to the hair and such procedure is to be repeated 2-3 times.

[0079] When the above-mentioned first direct heat treatment, as shown in FIG. 8, heat energy of non-metal member 13 is directly transferred to the hair (H). Also, a pair of non-metal members 13 press the hair while sliding down slowly towards the hair tips which straightens the hair (H).

[0080] Also the treatment (k) is mixed with the perm chemical (g) in an appropriate ratio and the mixture is applied to the hair. Above-mentioned hair direct heat treatment starts, above-mentioned treatment (k) penetrates deep into the hair (H) tissue, straightening the curly hair (H) and supplementing the hair with the nourishments.

[0081] Such invention gives the heat energy to the hair to which the perm chemical (g) is applied to straighten the hair. The moisture within the hair (H) does not evaporate during the process of the procedure and as a result, the hair does not get damaged and the treatment (k)'s nutrients penetrate deep into the hair (H) actively, making the hair healthier.

[0082] Thus, the invention adds the hair to straighten the hair (H) when there is still moisture in it. Hair's keratin and the moisture within the hair is intact and thus, the hair (H) surface is not flat as it was before and maintains its original form. Since the hair (H)'s profile is maintained intact in the original form, and not flat, the hair cuticles are not damaged as shown in FIG. 9(a). As a result the hair becomes elastic with each follicle coming alive, the hair does not stay flat as shown in FIG. 9(b) and allow more natural hair styling.

[0083] Then, the fourth stage, the second chemical application process which involves applying the protein balancing agent to the above-mentioned hair and neutralizer and leaving it for 10-15 minutes. Then the fifth stage, the cleansing process where the above-mentioned neutralizer is washed with water and treatment is performed and above-mentioned fourth and fifth stages are already known and the details for them will be omitted.

[0084] As for the temperature for the above-mentioned hair direct heat treatment as the heat gets transferred to the hair, for the extremely damaged hair, the temperature should be around 80-100 °C, the damaged hair, 110-130 °C, healthy hair, 140-200 °C. Thus by changing the tem-

perature for straightening the hair (H) depending on the state of hair, the procedure should be carried out in a way that does not damage the hair (H) and straightens the hair (H) in a desirable and satisfactory manner.

[0085] The procedure which involves coating the pressing coating layer on the hair surface can be explained as follows.

[0086] The procedural method which coats the pressing coating layer onto the surface of the above-mentioned hair is also called the pressing coating procedure.

[0087] Such procedure involves coating the pressing coating layer onto the surface of the hair and it is different from the dyeing method which makes the dye penetrates into the hair tissue.

[0088] Above-mentioned procedure applies the pressing coating to form a pressing coating layer onto the hair. Previous methods depended on the indirect heat treatment which could only apply about 45-60 °C, and as a result, the staying power of the coating suffered, making the coating layer stripped off soon but, this invention offers a way to resolve this problem.

[0089] Thus, this invention is the procedure which forms the pressing coating layer on the surface of the hair. For the first stage, the first chemical application which involves shampooing the hair and applying the protein treatment to the hair is performed.

[0090] For the second stage, the first direct heat treatment which involves dividing the above-mentioned into 1-3cm sections, inserting the hair between a pair of pressing plates 14, 14' with the non-metal member affixed to the metal member that receives heat energy from 100-130 °C of the electric heater each have a pair of non-metal members 13 press the hair while sliding down slowly towards the hair tips as shown in FIG. 2 to allow the transfer of heat energy to the hair and for this procedure to be repeated 2-3 times.

[0091] When the protein treatment and the hair get a high temperature of 100-120 °C, the hair swells and the liquidity of protein treatment becomes active, penetrating deep into the hair. As already know, for the strengthening of pressinging through the salt bonds, the protein gets supplemented in the areas where the hair's hair cortex and cuticle layers are missing. That is how the first direct heat process allows the hair swelling and penetration of hair chemical to happen as explained in various procedures.

[0092] Then the third stage, the second chemical application process involves cleansing the above-mentioned hair with water and towel-drying to remove excess water from the hair, applying the pressing coating to form the layer on the hair surface and leaving it for 9-11 minutes.

[0093] Then, for the fourth stage, the second direct heat treatment includes dividing the above-mentioned hair into 2-6cm sections, inserting the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from 100-120 °C of the electric heater, having a pair of non-

metal members press the hair while sliding down slowly towards the hair tips to allow the transfer of heat energy to the hair as shown in FIG. 9 for the procedure to be repeated 2-3 times and left for 9-11 minutes.

[0094] Here, colour coating agent (k) as shown in Figure 10 is the acidic dyes with a minus (-) charge and it electrically sticks to the hair (H) with the plus (+) charge for the coating. Here, the hair (H) gets heated to a high temperature of 120-160 °C, increasing the swelling and the penetration of pressing coating (k) with improved liquidity between the hair cortex and cuticle layers. Then, the coating works effectively with the bonding with the dye and as a result, to prevent the pressing coating layer from becoming separated from the hair surface after the procedure.

[0095] Then, for the fifth stage, the third direct heat treatment process where the hair is cleansed, protein coating agent is applied and repeating the same process as the above-mentioned second direct heat treatment is performed.

[0096] Here, coating agent is applied on the top of the colour coating layer and the direct heat treatment is performed again, making the protein from the protein coating harden with a high temperature of 120-160 °C. Therefore the hardened protein coating layer gets formed above the pressing coating layer, preventing the pressing coating layer's loss and delays the stripping of pressing coating layer and raising the staying power of the pressing coating layer on the hair surface.

[0097] Then, for the sixth stage, the cleansing process which involves washing the above-mentioned hair is performed. This invention has the advantage of procedure which helps the pressing coating layer to stay.

[0098] This invention offers the way to dye the hair.

[0099] The above-mentioned process is the first stage, the first chemical application process which involves shampooing the hair, mixing the first agent, dyes and the second agent, oxidizer and mixing the mixture and the treatment in 90:10 ratio to be applied to the hair.

[0100] This invention allows heat energy of high temperature to be directly transferred to hair during the dyeing. After mixing the first agent, dye and the second agent, oxidizer into the mixture and combining the treatment for application, the second stage where the nutrients penetrate into the hair to prevent the hair damage to the fullest extent is performed.

[0101] Therefore, for the second stage, the first direct heat treatment process starts.

[0102] The above-mentioned first direct heat treatment involves dividing up the hair into 2-6cm, inserting the hair between a pair of pressing plates with the non-metal member 13 affixed to the metal member that receives heat energy from 120-160 °C electric heater 11, having a pair of pressing plates 14, 14' press the hair (H) while sliding down slowly towards the hair tips to allow the transfer of heat energy as shown in FIG. 2 to the hair for the procedure to be repeated 2-3 times and left for 9-11 minutes.

[0103] The mixture which combines the first agent, dye and the second agent, oxidizer is the acid oxidative hair pressing created by the above-mentioned process. Such acid oxidative hair color becomes alkaline, breaking down the hydrogen peroxide and dyeing the hair by forming color by oxidizing the oxidative hair color. Such dyeing method is already well-known and the detailed explanations will be omitted.

[0104] However, this invention allows the active penetration of the dyes, oxidizers and protein treatment that can prevent the hair damage into the hair cortex. As in the case of previously mentioned procedural methods, heat energy of high temperature enhances the liquidity of the chemical and helps the hair to swell, enhancing the penetration by the chemical and improving the hair's absorption.

[0105] Furthermore, as in the case of this invention when a high heat energy gets directly applied to the hair, the cuticle layers swell, allowing the pigments to penetrate easily. With the added heat, the breakdown of hydrogen peroxide becomes active and a lot more active oxygen gets released. Active oxygen breaks down the melanin in the hair while the oxidized dyes increase the oxidation exponentially to form colors.

[0106] Then, for the third stage, the balancing process involves applying the protein balancing agent to the hair, leaving it for three minutes and cleansing with shampoo is performed. The fourth stage, the second direct heat treatment which involves applying the protein treatment to the hair and repeating the process identical to the above-mentioned first direct heat treatment and leaving the hair for three minutes is performed.

[0107] Therefore, the protein treatment from the above-mentioned fourth stage, is applied to the surface of the hair dyed by the second direct heat treatment. By performing the direct heat treatment again, the protein becomes hardened at a high temperature of 120-160 °C, allowing the dyes to stay for a long period of time. Finally, the fifth stage, the hair cleansing process which involves washing the hair completes the procedure.

[0108] The invention offers the way to remove the dyes from the hair.

[0109] The above-mentioned method is the first stage and the first chemical application process which involves shampooing the hair, mixing the first agent, dye remover an second agent, dye remover in 1:1 ratio to be applied to the hair and leaving it for 10-30 minutes.

[0110] Then, for the second stage, the first direct heat treatment which involves dividing hair into sections of 2-6cm, inserting the hair between a pair of pressing plates with the non-metal member 13 affixed to the metal member that receives heat energy from 130-160 °C of the electric heater 11, having a pair of pressing plates 14, 14' press the hair (H) while sliding down slowly towards the hair tips to allow the transfer of heat energy as shown in FIG. 2 to the hair for the procedure to be repeated 2-3 times is performed.

[0111] When the heat energy of 130-160 °C is applied

directly to the hair, the moisture and dye remover become active, breaking down the artificial dyes with the chemical reducing process and releasing it to the outside of the hair. The above-mentioned process where the dye remover becomes active and breaks down the artificial dye with the chemical reducing reaction is already known and the details for this will be omitted.

[0112] Also, a pair of non-metal members 13 press the hair (H) while sliding down towards the hair tips by pressing the hair is like squeezing dyes. Artificial dyes become released by the chemical reducing reactions while squeezing out the dyes, allowing more speedy removal of dyes.

[0113] Next, for the third stage, the second chemical application process where the hair is cleansed with the alkaline shampoo, dried and the protein treatment is applied to the hair is performed.

[0114] Then, for the fourth stage, the second direct heat treatment which involves dividing hair into sections of 2-6cm, inserting the hair between a pair of pressing plates with the non-metal member 13 affixed to the metal member that receives heat energy from 100-120°C electric heater 11, having a pair of pressing plates 14, 14' press the hair (H) while sliding down slowly towards the hair tips to allow the transfer of heat energy as shown in Figure 2 to the hair for the procedure to be repeated 2-3 times is performed.

[0115] Also, for the fifth stage, the third direct heat treatment which involves applying the protein coating to the hair and repeating the same process as the above-mentioned second direct heat treatment is performed.

[0116] In the above-mentioned fourth and fifth stages, the chemical is applied to the hair and the direct heat of 100-120 °C is applied. In case of protein treatment, it helps the penetration and the protein coating becomes coated more strongly to make them more adhesive. This has been explained several times previously for other procedures and thus, the details for this will be omitted.

[0117] Thus, the cleaning process where the hair is cleansed is performed for the sixth stage and the dye removal is completed.

[0118] This invention offers a way to remove the coated color coating layer from the hair surface.

[0119] The above-mentioned color coating layer removal is the fourth stage and the first chemical application process which involves shampooing the hair, mixing the coating agent and treatment 50:50 to be applied to the hair and leaving it for 10-30 minutes is performed.

[0120] Then, for the second stage, the first direct heat treatment which involves dividing hair into sections of 2-6cm, inserting the hair between a pair of pressing plates with the non-metal member 13 affixed to the metal member that receives heat energy from 100-130 °C electric heater 11, having a pair of pressing plates 14, 14' press the hair (H) while sliding down slowly towards the hair tips to allow the transfer of heat energy as shown in FIG. 2 to the hair for the procedure to be repeated 2-3 times is performed.

[0121] When a high heat of 100-130 °C is applied to the coating removing agent and hair, the hair swells, expanding the hair tissues. Then the coating agent with the activated liquidity penetrates with ease into the hair cortex and cuticles, the pigments get washed out to be removed by the chemical reaction of the coating agent.

[0122] If the procedure did not remove the color satisfactorily, the second stage of the procedure will be carried out once again.

[0123] For the third stage, the second direct heat treatment which involves shampooing the hair with alkaline shampoo, applying the protein treatment and repeating the procedure identical to the first direct heat treatment is performed. Finally, the fourth stage is the cleansing process which involves cleansing the hair for the completion of the procedure.

[0124] In the above-mentioned third stage, the protein treatment is applied to the hair and a direct heat of 100-130°C is applied to the hair to repair the damaged parts and supply nutrients. Since this has been explained several times in other procedures mentioned previously, the details for it will be omitted.

[0125] Next, the method of bleaching the hair with this invention will be explained.

[0126] The above-mentioned procedure is the fourth stage for the scalp protection process which involves shampooing the hair and applying the scalp protector.

[0127] Then, for the second stage the first chemical application process which involves mixing the bleach, oxidizer and treatment and applying it to the hair are carried out. Afterwards for the third stage, the first direct heat treatment process is performed.

[0128] The above-mentioned first direct heat treatment which involves dividing hair into sections of 2-6cm, inserting the hair between a pair of pressing plates with the non-metal member 13 affixed to the metal member that receives heat energy from 100-120 °C of the electric heater 11, having a pair of pressing plates 14, 14' press the hair (H) while sliding down slowly towards the hair tips to allow the transfer of heat energy as shown in FIG. 2 to the hair for the procedure to be repeated 2-3 times.

[0129] Then, for the fourth stage, protein balancer is applied to the above-mentioned hair and the hair is left for two minutes. Then the balancing process where the hair is cleansed is performed. For the fifth stage, the second heat treatment which involves applying the protein treatment to the hair and repeating the same process as the above-mentioned first direct heat treatment is performed. Then, for the sixth stage, the cleansing process where the hair is cleansed is completed.

[0130] this invention is to prevent the stains and reduce damage to the hair. In the above-mentioned third stage, when the hair is heated to a high temperature when there is the bleach, oxidizer and treatment with moisture, the reaction of hydrogen peroxide becomes active, the active oxygen breaking down melanin fast to bleach the hair. The above-mentioned reactions have already been explained previous and the details for this will be omitted.

[0131] Also for the fifth stage, when the protein treatment is applied and the heat treatment is performed to the hair as with this invention, it supplements nutrients and repairs the damage in the hair. This has been explained several times from other procedures previously mentioned and thus, the details for this will be omitted.

[0132] By performing the invention again, the hair gets softened and provides the way of perming by the perm rods.

[0133] The above-mentioned procedure includes getting rid of excess hair with towel after the shampoo and applying the first agent, perm chemical to the hair, which is the first chemical application process for the first stage.

[0134] When the state of hair is damaged, the treatment can be mixed with the perm chemicals to be applied on hair.

[0135] Next, for the second stage, first direct heat treatment which involves dividing hair into sections of 2-6cm, inserting the hair between a pair of pressing plates with the non-metal member 13 affixed to the metal member that receives heat energy from 100-120 °C of the electric heater 11, having a pair of pressing plates 14, 14' press the hair (H) while sliding down slowly towards the hair tips to allow the transfer of heat energy as shown in FIG. 2 to the hair for the procedure to be repeated 2-3 times is performed.

[0136] Thus, in the second stage, 100-120 °C of heat is applied to the hair which allows the swelling of the hair. The liquidity of perm chemical gets enhanced, activating the alkaline and reducing agents in the chemical which relaxes the swollen cuticles. When the reducing agent penetrates into the hair, it cuts the cystine bond. The above-mentioned reactions of the chemical are already known as the reaction that breaks the hair's cystine bonds and details for this will be omitted.

[0137] Next, the second agent, neutralizer is applied to the hair. After coiling the hair in the perm rods and leaving it for 10-15 minutes, the second chemical application process which involves the acid rinsing starts, followed by removing the perm rods and cleansing with shampoo. Above-mentioned second chemical process has been used previously used and the details for it will be omitted.

[0138] To help the understanding of this invention, in the past, the first stage, the above-mentioned procedure was performed only in the first chemical application process and the third stage, the second chemical processing. So, the time required for perming was long and the curls were not formed properly, making a satisfactory perming procedure difficult. However with the direct heat treatment process, which is the second stage of this invention, the third stage is carried out when the hair is already softened, helping the curls form properly. Also, the time for leaving the hair after applying the perm chemical is cut down, reducing the time it takes for perming and allowing the perming to finish sooner.

[0139] Also, the invention offers the procedure which straightens curly hair with the degeneration of protein in

hair.

[0140] The first chemical application process involves drying the hair which has been shampooed and applying the protein nourishment to the hair is performed for the first stage.

[0141] Also, for the second stage, first direct heat treatment which involves dividing hair into sections of 2-5cm, inserting the hair between a pair of pressing plates with the non-metal member 13 affixed to the metal member that receives heat energy from 100-120 °C of the electric heater 11, having a pair of pressing plates 14, 14' press the hair (H) while sliding down slowly towards the hair tips to allow the transfer of heat energy as shown in FIG. 2 to the hair for the procedure to be repeated 2-3 times is performed.

[0142] In the process, the hair receives the heat energy of 100-120 °C when the protein nourishment has been already applied, making the hair swell and relaxes while the liquidity of protein nourishment improves and becomes active to allow the keratin to penetrate deep into the hair.

[0143] Then, for the third stage, the second chemical application process which involves drying the hair with hot air and applying the protein coating to the hair is performed. Then, for the fourth stage, the second direct heat treatment which repeats the process identical to the above-mentioned first direct heat treatment is performed.

[0144] Therefore, as in the case of other procedures previously mentioned, the protein coating which has been applied to the hair becomes hardened at a high temperature, the coating stays on the hair firmly.

[0145] For the fifth stage involves sliding the hair between a pair of hot plates of the conventional electric hair iron to degenerate the protein to strengthen the hair.

Then, the straight perming process where the hair is left for 72 hours followed by shampoo washing is performed.

[0146] Accordingly, invention supplies the protein nourishment to dry and frizzy hair or curly hair as shown in FIG. 11(a). Protein coating allows the coating and the high temperature changes the protein to become hardened. The procedure is to have the hair straightened and the protein to stay intact for a long time as shown in FIG. 11(b).

[0147] While the invention has been shown and described with reference to different embodiments thereof, it will be appreciated by those skilled in the art that variations in form, detail, compositions and operation may be made without departing from the spirit and scope of the invention as defined by the accompanying claims.

Claims

1. A hair heat treatment apparatus for chemical applied hair, comprising an electric heater to generate heat energy;
a metal member having heat transfer coefficient of 150kcal/m²H°C or more;

a non-metal member having the heat transfer coefficient of $0.20 \text{ kcal/m}^2\text{H}^\circ\text{C}$ or less;

wherein the heat energy of the electric heater is transferred to the metal member and then to the non-metal member and the heat energy of the non-metal member is transferred to hair by the non-metal member's direct contact with hair.

2. The hair heat treatment apparatus of claim 1, further comprising a pair of pressing plates to allow the non-metal member to be in direct contact with hair when pressed.

3. The hair heat treatment apparatus of claim 1, wherein the metal member is made of stainless or aluminum and the non-metal member is made of rubber or plastic.

4. A hair treatment method to repair damaged hair, comprising
chemical application process which applies the protein nourishment to the folds of hair surface after shampooing the hair;
first direct heat treatment process which divides the hair into 1-3cm sections, each section of which is inserted between a pair of pressing plates to be pressed and slid down slowly towards the hair tips for allowing the transfer of heat energy to the section of hair, and repeats the insertion, pressing and sliding down process 2-3 times;
cleansing and towel-drying process which cleanses the hair with water and towel-dries the hair to remove water; and
second direct heat treatment process which involves repeating the first direct heat treatment step 3-4 minutes after applying the protein coating agent to the hair, wherein the electric heater has the temperature of $100-120^\circ\text{C}$ and the heat energy of the electric heater transfers to the metal member and then to the non-metal member, a pair of the non-metal members pressing against the hair for transfer of heat energy to the hair.

5. A hair treatment method to straighten curly hair, comprising
first chemical application process which involves shampooing curly hair and applying the perm chemical to the surface of curly hair;
direct heat treatment process which includes dividing the hair into 1-3cm sections, each section of which is inserted between a pair of pressing plates to be pressed and slid down slowly towards the hair tips for allowing the transfer of heat energy to the hair, and repeats the insertion, pressing and sliding down process 2-3 times;
second chemical application process which involves applying to the hair the protein balancing agent and then neutralizer, and leaving it for 10-15 minutes; and

the process of cleansing the hair with water.

6. The hair treatment method of claim 5, further comprising the process of dividing the hair into sections of 1-3cm, each section of which is inserted between a pair of pressing plates to be pressed and slid down slowly towards the hair tips for allowing the transfer of heat energy to the hair between the first chemical application process and the direct heat treatment process, wherein the electric heater has the temperature of $80-100^\circ\text{C}$ and the heat energy of the electric heater transfers to the metal member and then to the non-metal member, a pair of the non-metal members pressing against the hair for transfer of heat energy to the hair.
7. The hair treatment method of claim 5, wherein the temperature of the electric heater may be around $80-100^\circ\text{C}$ for the case of extremely damaged hair, $110-130^\circ\text{C}$ for the case of mildly damaged hair, and $140-200^\circ\text{C}$ for the case of healthy hair.
8. A hair treatment method for color coating of hair surface, comprising
first chemical application process which involves shampooing the hair and applying protein treatment agent to the hair;
dividing the hair into 1-3cm sections, each section of which is inserted between a pair of pressing plates to be pressed and slid down towards the hair tips, and repeats the insertion, pressing and sliding down process 2-3 times, wherein the temperature of the electric heater is set to $100-120^\circ\text{C}$;
second chemical application process which involves cleansing the hair with water, towel-drying it to remove water and applying color coating agent to form the coating layer on the hair surface, waiting for 9-11 minutes before the beginning of next process;
second direct heat treatment which includes dividing the hair into 2-6cm sections, each section of which is inserted between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of $120-160^\circ\text{C}$, having a pair of non-metal members to press each section of the hair while sliding down slowly towards the hair tips for allowing the transfer of heat energy to the hair and repeats the insertion, pressing and sliding down process 2-3 times;
waiting for 9-11 minutes;
third direct heat treatment which involves cleansing the hair, applying the protein coating agent and repeating the same process as the second direct heat treatment process; and
the hair procedure which includes cleansing hair.
9. A hair treatment method for dyeing hair, comprising first chemical application process which involves shampooing the hair, mixing 90 weight % of the mix-

ture of dyes and oxidizer and 10 weight % of treatment and applying it to the hair;
 first direct heat treatment which includes dividing the hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 120-160°C, having a pair of non-metal members to press each section of the hair to be pressed and slid down towards the air tips to transfer the heat energy to the hair, repeating the pressing and sliding down process for 2-3 times;
 waiting for 9-11 minutes;
 balancing process which involves applying the protein balancing agent to the hair, thereafter waiting for 3 minutes and cleansing the hair with shampoo; applying the protein treatment to the hair and thereafter, second direct heat treatment which repeats the same process as the first direct heat, thereafter waiting for 3 minutes; and
 cleansing and washing the hair.

10. A hair treatment method for bleaching hair, comprising

first chemical application process which involves shampooing the hair, mixing the primary dye remover and the secondary dye remover in 1:1 ratio, applying it to the hair, and waiting for 10-30 minutes;
 first direct heat treatment which includes dividing the above-mentioned hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 130-160°C, having a pair of non-metal members press each section of the hair to be pressed and slid down slowly towards the hair tips for allowing transfer of heat energy to the hair, repeating the insertion, pressing and sliding down process for 2-3 times;
 second chemical application process which involves applying protein treatment to the hair, cleansing the hair with alkaline shampoo and drying the hair, and applying protein treatment to the hair; second direct heat treatment which involves dividing the hair into 2-6cm sections, inserting each section of the hair into a pair of the pressing plate having the electric heater of 100-120°C, having a pair of the non-metal members press the hair while pressing the section of the hair and sliding down slowly towards the hair tips for allowing transfer of heat energy to the hair, repeating the insertion, pressing and sliding down process for 2-3 times;
 third direct heat treatment which involves applying protein coating to the hair and repeating the second direct heat treatment; and
 cleansing the hair.

11. A hair treatment method for removing color coating

layer on hair surface, comprising
 first chemical application process which involves shampooing the hair, mixing the coating remover and treatment in 50:50 ratio to be applied to the hair and waiting for 10-30 minutes;
 first direct heat treatment which includes dividing the hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 100-130°C, having a pair of the non-metal members press the hair and slide down slowly towards the hair tips for allowing transfer of heat energy to each section of the hair, repeating the insertion, pressing and sliding process for 2-3 times;
 washing the hair with alkaline shampoo and applying protein treatment to the hair, and second direct heat treatment which repeats the same process as the first direct heat treatment; and
 cleansing and washing the hair.

12. A hair treatment method for bleaching hair, comprising

first chemical application process which involves shampooing the hair, drying it and the scalp protection process where the scalp protector is applied;
 first chemical application process which involves mixing the bleaching, oxidizing agents and the treatment and applying the mixture to the hair;
 first direct heat treatment which includes dividing the hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 100-120°C, having a pair of non-metal members press the hair and slide down slowly towards the hair tips for allowing transfer of heat energy to each section of the hair, repeating the insertion, pressing and sliding process for 2-3 times;
 balance process which includes applying protein balancing agent to the hair, waiting for 2 minutes and washing the hair with shampoo;
 the second heat treatment which includes applying protein treatment to the hair and repeating the same process as the first direct heat treatment; and
 cleansing and washing the hair.

13. A hair treatment method for promoting the softening of hair and perming the hair with the perm rods, comprising

first chemical application process which includes shampooing the hair, towel-drying the hair to remove water and applying perm chemical to the hair;
 direct heat treatment which includes dividing the hair into 2-6cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of

100-130°C, having a pair of the non-metal members press the hair and slide down slowly towards the hair tips for allowing transfer of heat energy into each section of the hair, repeating the insertion, pressing and sliding process for 2-3 times; 5
 second chemical processing which includes applying neutralizer to the hair, winding the hair to the perm rods and waiting for 10-15; and
 processes of acidic rinsing, removing the perm rods, and washing the hair with shampoo. 10

- 14.** A hair treatment method of for straightening curly hair by degeneration of protein in the hair, comprising first chemical application process which involves shampooing the hair, drying the hair and applying protein nourishment to the hair; 15
 direct heat treatment which includes dividing the hair into 2-5cm sections, inserting each section of the hair between a pair of pressing plates with the non-metal member affixed to the metal member that receives heat energy from the electric heater of 100-130°C, having a pair of the non-metal members press the hair and slide down slowly towards the hair tips for allowing transfer of heat energy to each section of the hair, repeating the insertion, pressing and sliding process for 2-3 times; 20 25
 second application process which includes drying the hair with hot air and applying protein coating to the hair;
 second heat treatment which repeats the same process as the first direct heat treatment; sliding each section of the hair between a pair of hot plates of the electric hair iron for degenerating the protein in the hair at a high temperature; and 30
 waiting for 72 hours and cleansing and washing the hair with shampoo. 35

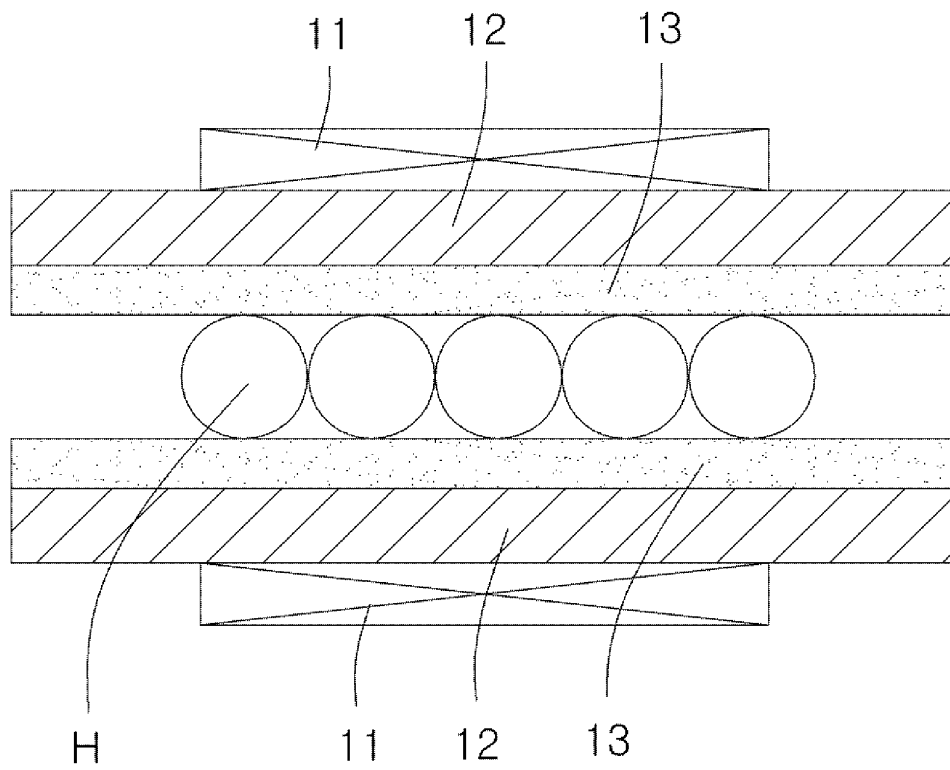
40

45

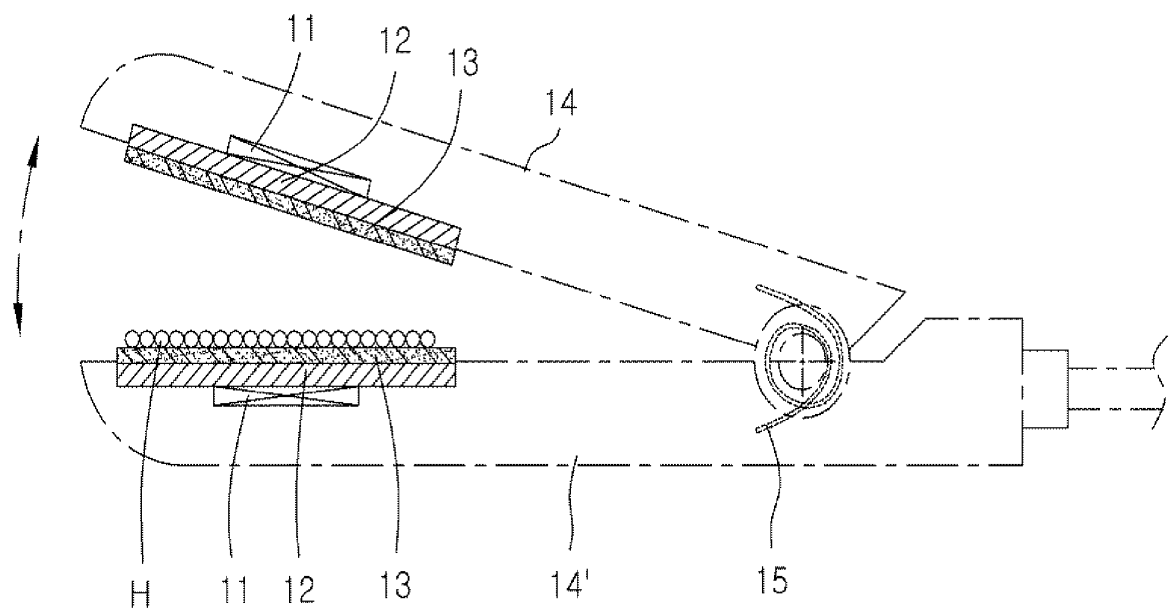
50

55

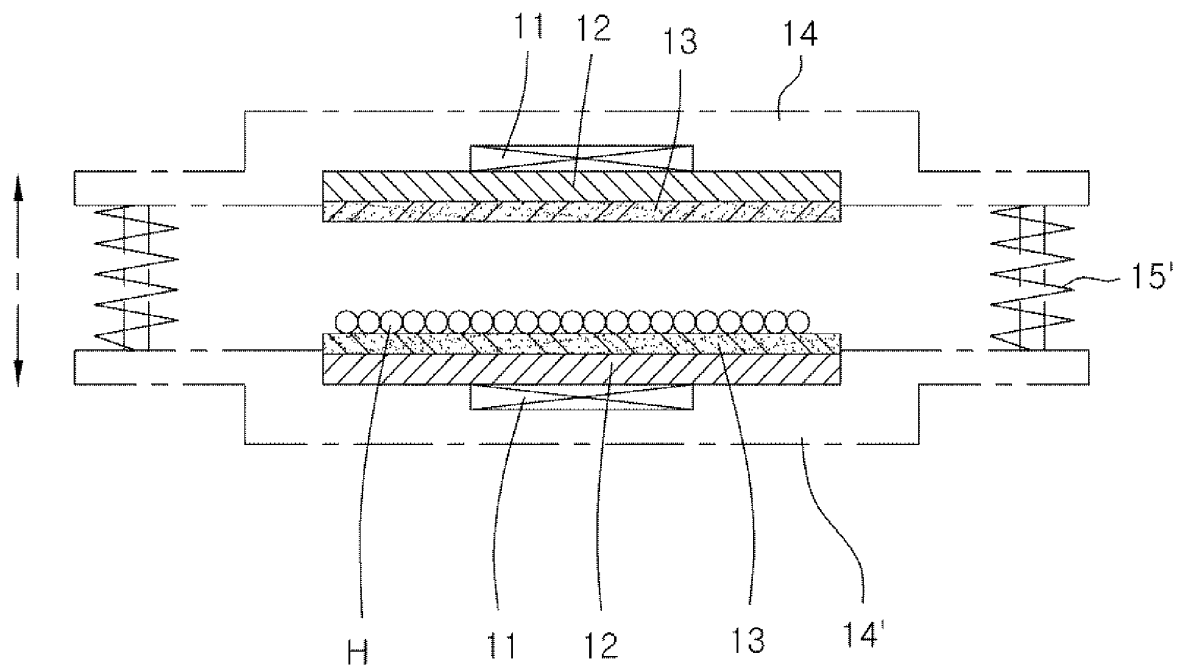
[Fig. 1]



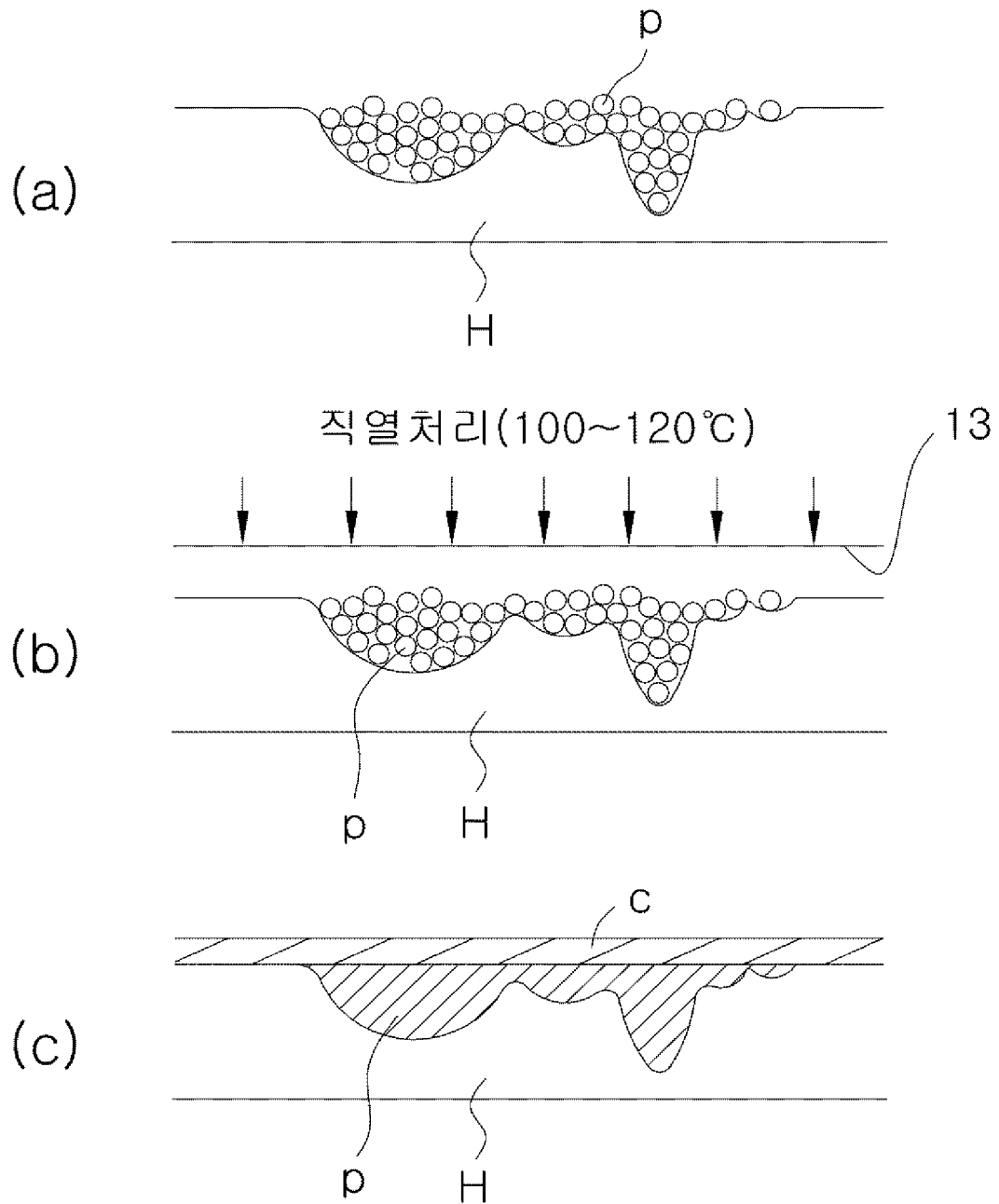
[Fig. 2]



[Fig. 3]

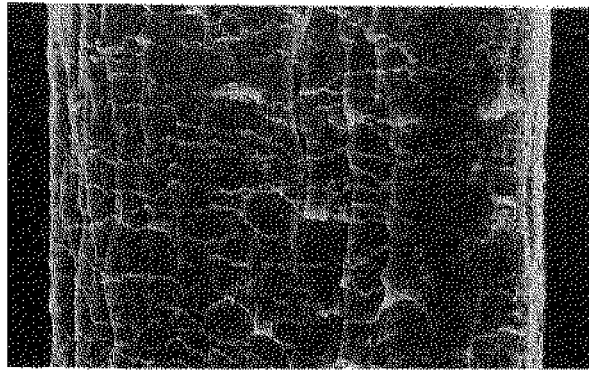


[Fig. 4]

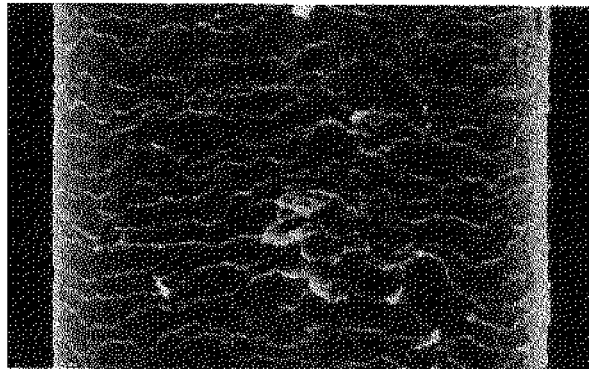


[Fig. 5]

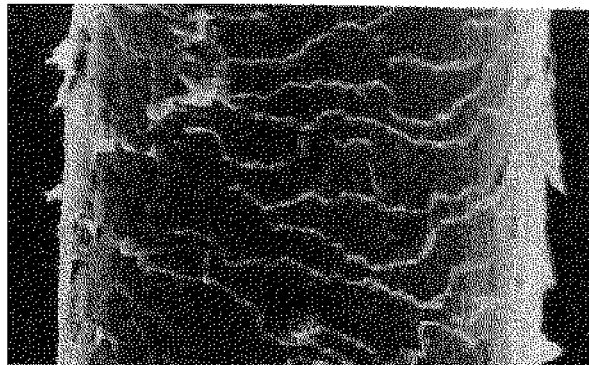
(a)



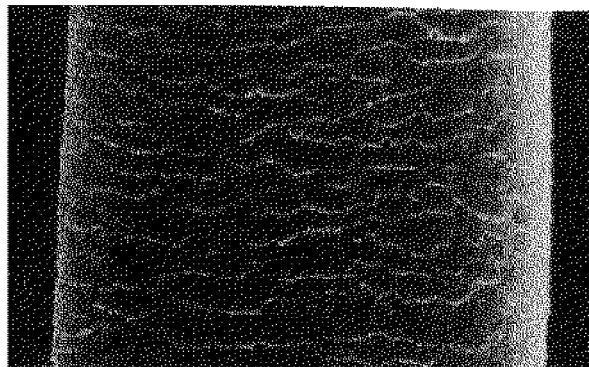
(b)



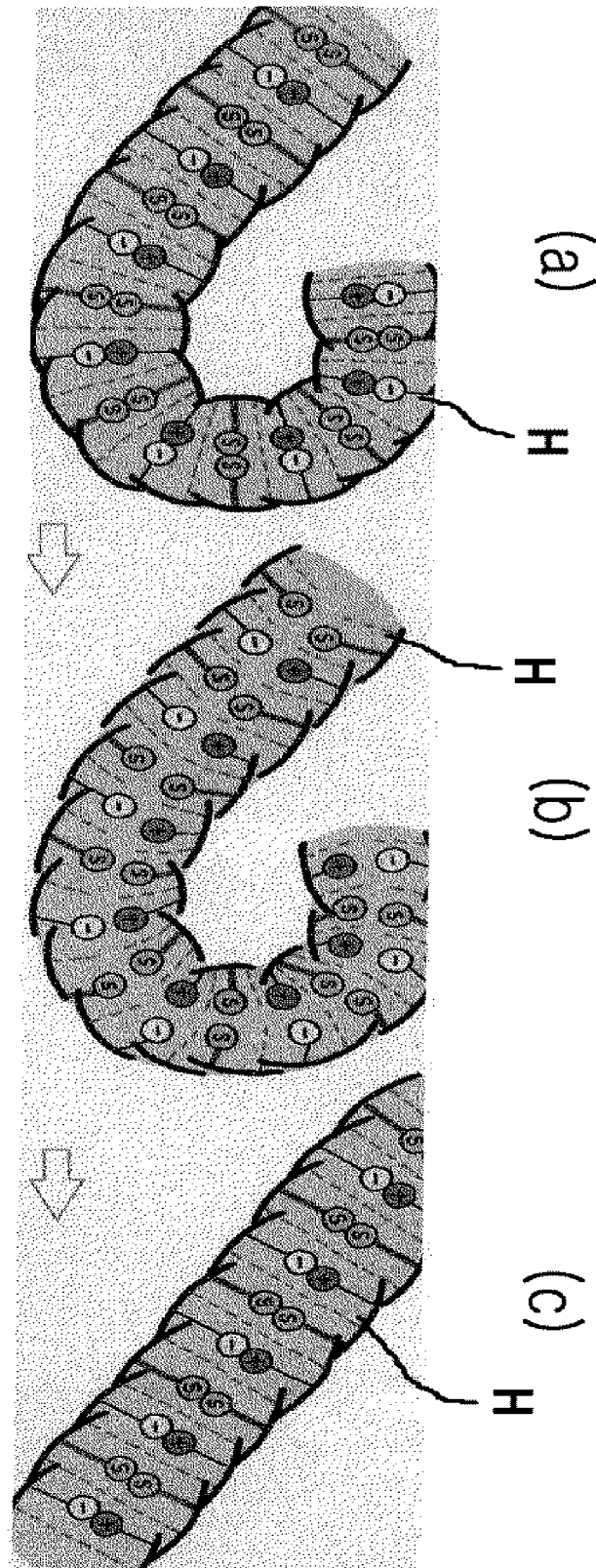
(c)



(d)

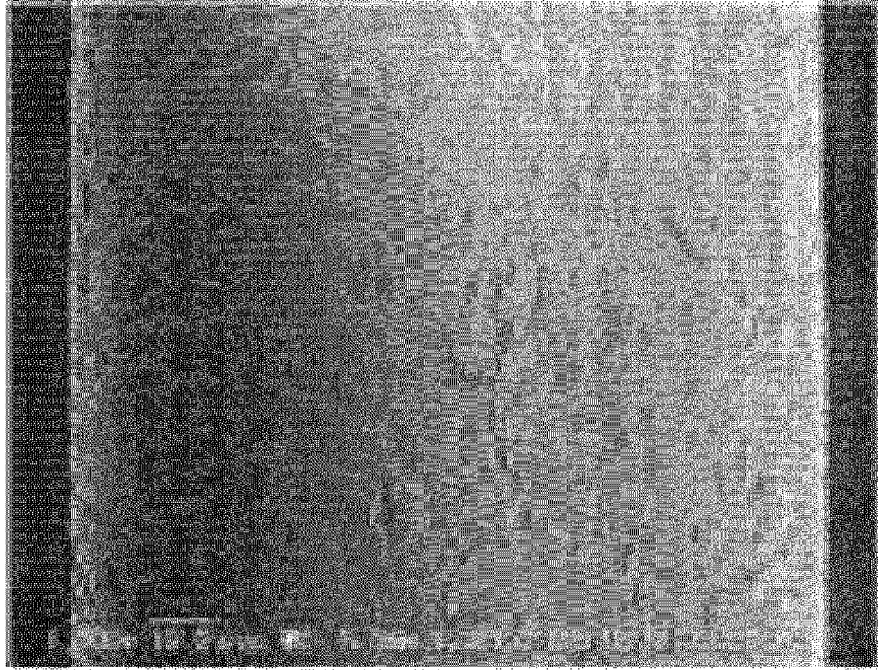


[Fig. 6]



[Fig. 7]

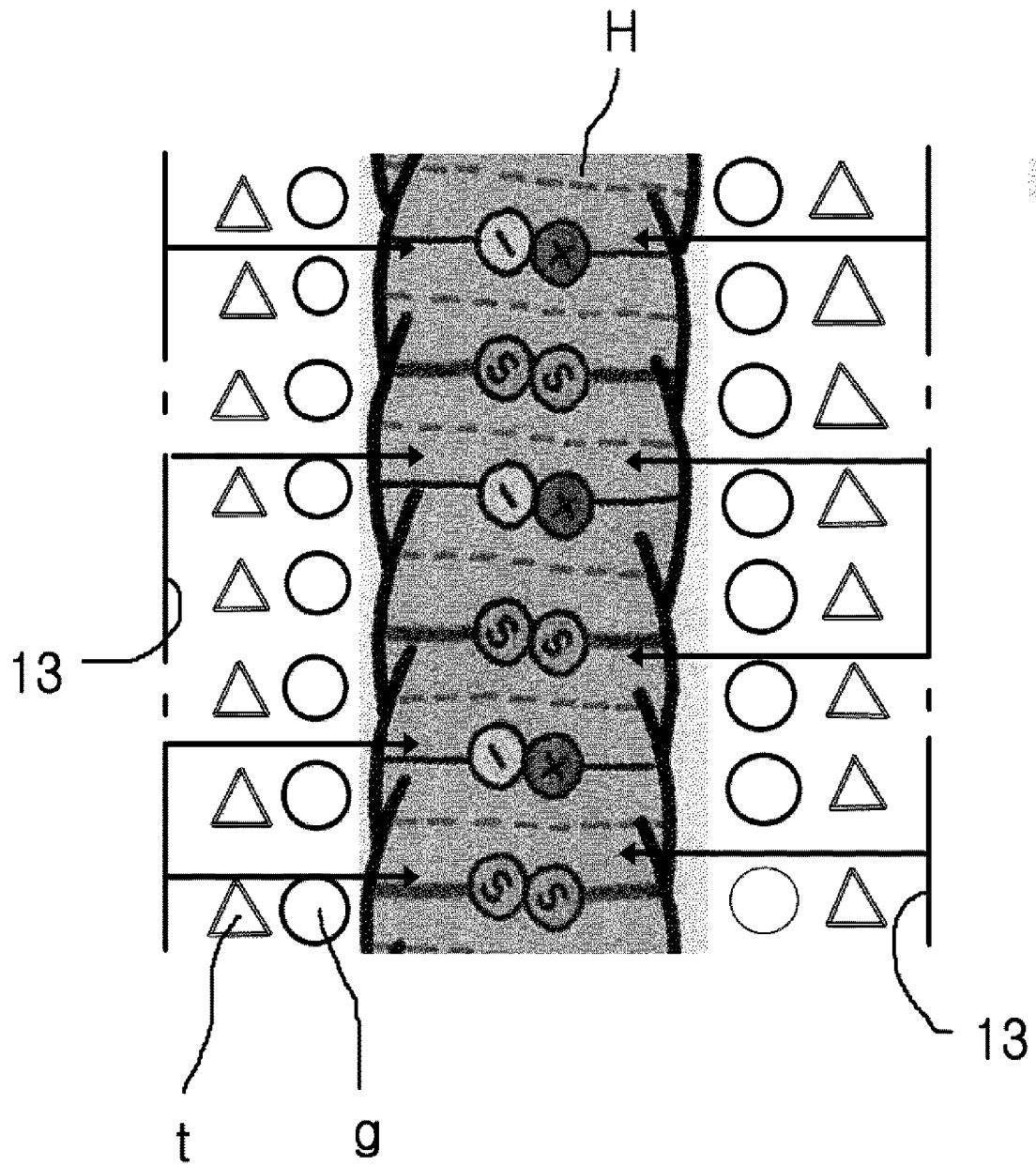
(a)



(b)

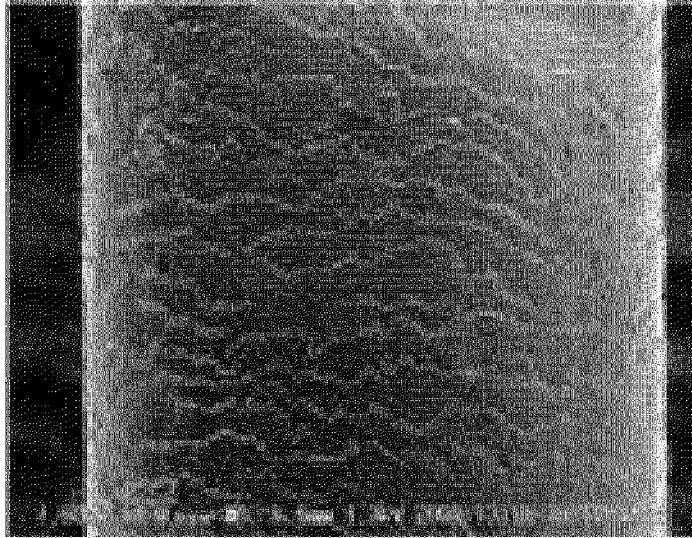


[Fig. 8]



[Fig. 9]

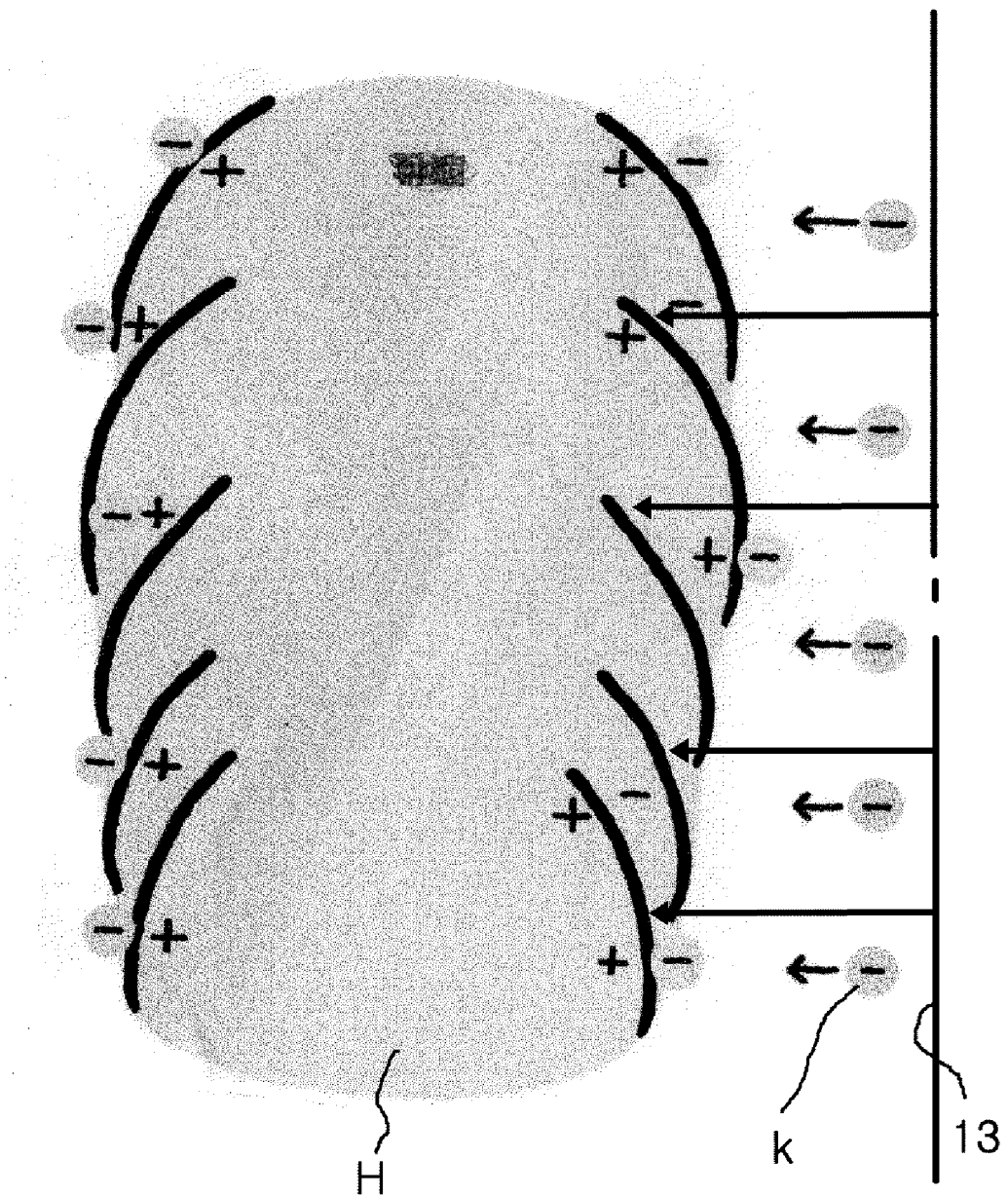
(a)



(b)



[Fig. 10]

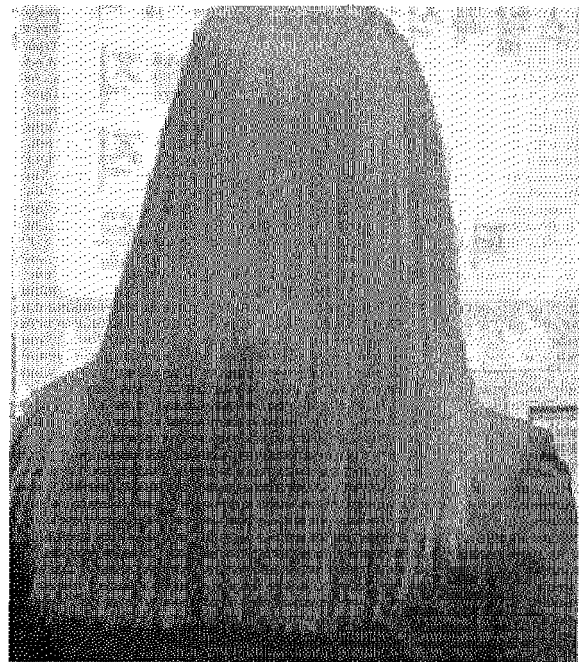


[Fig. 11]

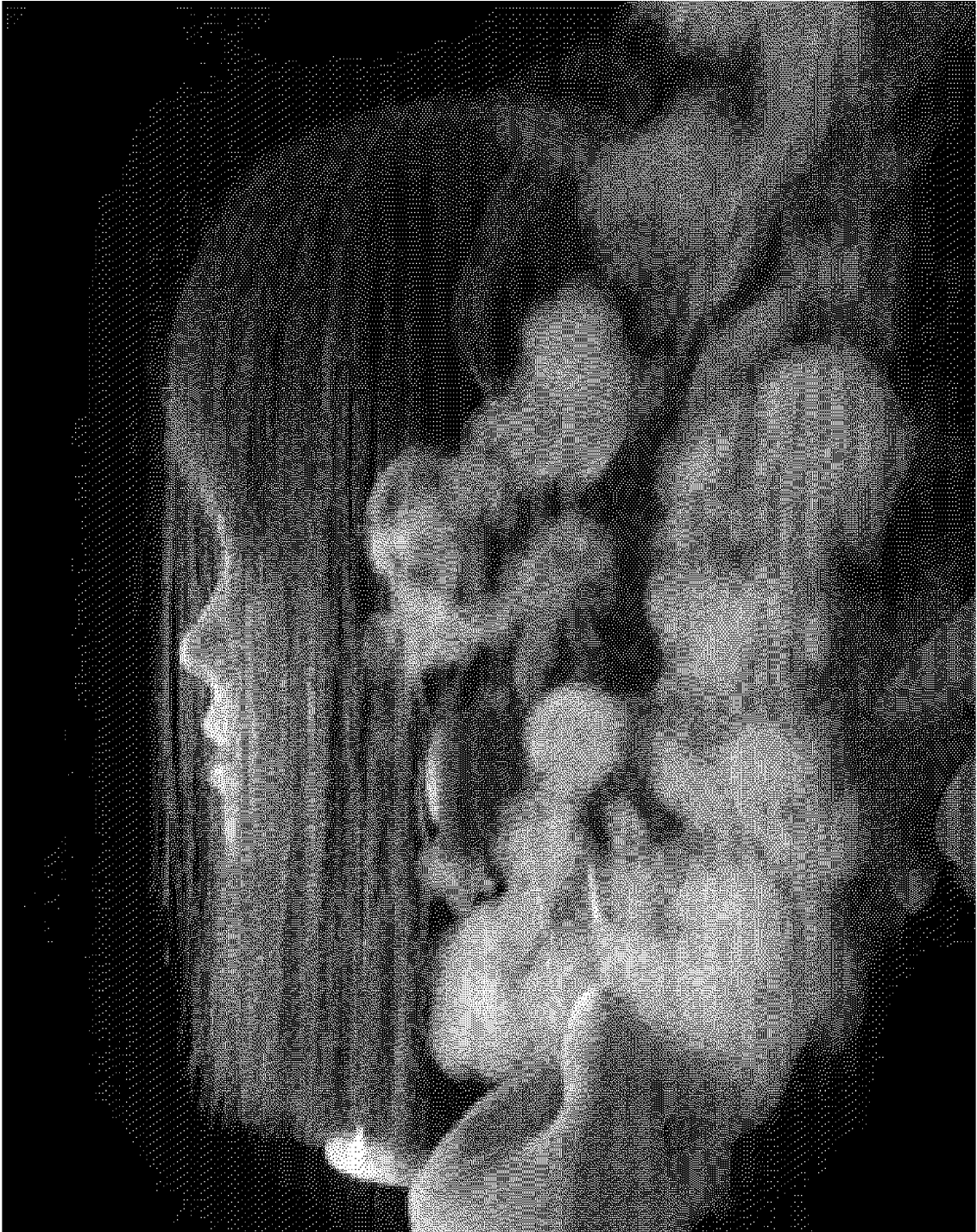
(a)



(b)




[Fig. 12]



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2010/007164

A. CLASSIFICATION OF SUBJECT MATTER A45D 7/06(2006.01)i, A45D 1/04(2006.01)i, A45D 7/00(2006.01)i 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) A45D 7/06; A45D 7/00 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Korean Utility models and applications for Utility models: IPC as above Japanese Utility models and applications for Utility models: IPC as above Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) eKOMPASS (KIPO internal) & Keywords: hair, heat treatment, perm		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	KR 10-2010-0025372 A (SIM, GUK HYUN) 09 March 2010 See abstract, claims 1-4, detailed description of the invention pages 3,4, figure 1	1-14
A	KR 10-0537898 B1 (LEE, SOON HWA) 20 December 2005 See abstract, claim 1, detailed description of the invention pages 2,3, figure 1	1-14
A	KR 10-0780543 B1 (KIM, SONG JEONG) 30 November 2007 See abstract, claim 1, detailed description of the invention pages 4,5, figures 1-4	1-14
<input type="checkbox"/> Further documents are listed in the continuation of Box C. <input checked="" type="checkbox"/> 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 "I" 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 26 OCTOBER 2011 (26.10.2011)		Date of mailing of the international search report 27 OCTOBER 2011 (27.10.2011)
Name and mailing address of the ISA/KR  Korean Intellectual Property Office Government Complex-Daejeon, 139 Seonsa-ro, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140		Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/KR2010/007164

Patent document cited in search report	Publication date	Patent family member	Publication date
KR 10-2010-0025372 A	09.03.2010	NONE	
KR 10-0537898 B1	20.12.2005	NONE	
KR 10-0780543 B1	30.11.2007	NONE	

Form PCT/ISA/210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.

Patent documents cited in the description

- KR 2010007164 W [0001]
- KR 1020100086867 [0001]
- KR 200131822 [0004]
- KR 200167285 [0004]
- KR 200319890 [0004]