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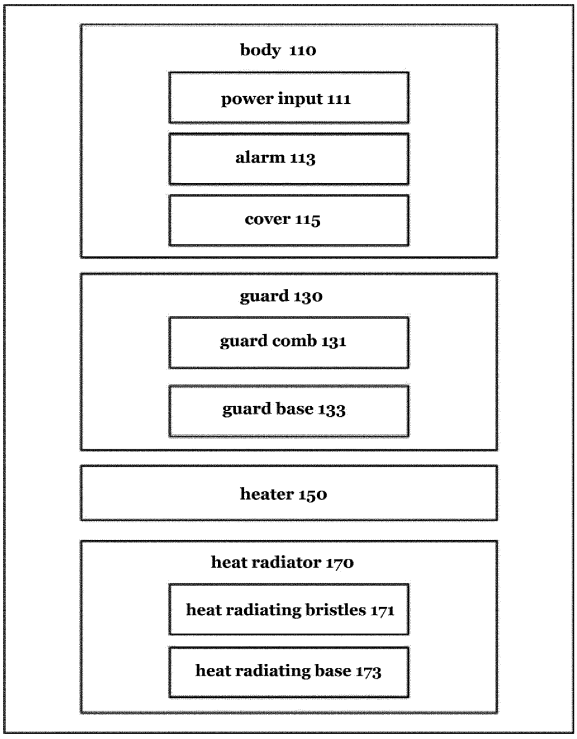
(54) BRUSH HAVING HEATER EMBEDDED THEREIN AND MANUFACTURING METHOD THEREFOR

(57) The present invention relates to a brush having a heater embedded therein, and provides a brush having a heater embedded therein, capable of fixing hair through only the simple brushing of hair by heating the bristles of a brush, capable of preventing, in advance, an accident such as a burn caused by the heated bristles since a guard is formed in the edge part of the heated bristles, and having sterilizing and deodorizing functions using a platinum catalyst. To this end, according to the present invention, the brush having a heater embedded therein comprises: a body including a power input, an alarm and a cover; a guard including a guard comb having a plurality of round bars and a guard base for fixing the guard comb thereto; a heater; and a heat radiator having a plurality of heat radiating bristles for transferring the heat generated from the heater and a heat radiating base for fixing the heat radiating bristles thereto.

FIG. 1



EP 3 295 826 A1

Description

TECHNICAL FIELD

[0001] The present invention relates to a brush having a heater embedded therein and more particularly to a brush having a heater embedded therein capable of preventing damage to the skin by preventing the generated heat from coming into direct contact with the skin. The brush having a heater embedded therein of the present invention may be referred to as a heater embedded brush.

BACKGROUND ART

[0002] Generally, a hair brush is a kind of beauty appliance suitable for arranging or grooming tangled hair, having a plurality of soft bristles or elastic bristles alternately on one side of a body having a handle. A comb is also used for grooming hair. However, the comb teeth are arranged in a straight line and sometimes it is not suitable for straightening long and tangled hair. A comb is more suitable for straightening short hair than long and tangled hair.

[0003] Most of the hair brushes suitable for brushing the soiled, long and tangled hair are in the form of a round bar having a predetermined length and thickness, and the tip of the round bar is formed as a rounded head so as to provide a massaging effect without damaging the scalp.

[0004] Both hair brushes and combs have many inconveniences with wet hair or curly hair. As a method of grooming such hair, there has been used a method of grooming the hair using a hot article such as a hair dryer. However, in this case, the hair dryer should be used with one hand and the comb or brush with the other hand. Since both hands should be used, it is not easy to get a desired shape at a desired area of the hair.

[0005] In recent years, there have been many cases where the hair is groomed by using a hair styling apparatus provided with a plate-type heat plate on the inner surface of the ends of a pair of hinged knobs. Although, these hair styling apparatus have a great effect on hair care, but if not an expert, it is possible to damage the hair severely due to the heated heat plate and to easily burn the finger or scalp. Even an expert cannot easily style on the back of his/her head and needs a lot of time and effort to care for hair, especially in case of long and thick hair.

[0006] When the hair is treated with hair brush, hair and dandruff may be attached to the brush and the brush may become a habitat of bacteria or ticks. When a brush is shared by members of the family, if there is a patient having a scalp disease in the family, the bacterium of the patient's scalp or microbial ticks can easily spread to other people within the family.

[0007] In addition, in the case of a pet such as a dog or a cat, a bad odor is caused by various bacteria and ticks in the skin of a pet. To solve this problem, there is an increasing demand for an antibacterial brush.

SUMMARY

Technical Problem

[0008] It is an object of the present invention to provide a brush having a heater embedded therein which can heat hair by merely brushing hair and transferring heat generated by an embedded electric heater to the bristles of the brush.

[0009] It is another object of the present invention to provide a brush having a heater embedded therein which prevents the possibility of burning a finger or the like due to bristles heated by the electric heater by forming a guard surrounding the edge of the brush.

[0010] It is another object of the present invention to provide a brush having a heater embedded therein which prevents the possibility of burning the scalp or the like due to bristles heated by the electric heater.

[0011] It is another object of the present invention to provide a brush having a heater embedded therein that can protect the scalp and hair safely and hygienically from the contamination of bacteria.

Technical Solution

[0012] According to some embodiments of the present invention, a brush having a heater embedded therein includes: a body including a power input, an alarm and a cover; a guard including a guard comb having a plurality of round bars and a guard base for fixing the guard comb thereto; a heater; and a heat radiator including a plurality of heat radiating bristles for transmitting heat generated by the heater, and a heat radiating base for fixing the heat radiating bristles thereto.

[0013] The guard comb is formed at an edge of the brush and surrounds the heat radiator.

[0014] The guard comb is formed of polycarbonate (PC), polyamide or a combination thereof.

[0015] The guard base is formed of heat resistant plastic.

[0016] The guard base is formed of polycarbonate (PC), polyamide or a combination thereof.

[0017] The heat radiating bristles are formed of metal.

[0018] Each of the heat radiating bristle further includes a plastic cap at the tip.

[0019] The heat radiating base further includes a platinum catalyst.

[0020] According to some embodiments of the present invention, the method of manufacturing a brush having a heater embedded therein comprises the steps of: fabricating a body and a guard by injection molding; fabricating a heat radiator; fixing a heater in a space between the body and the guard; and assembling the body, the guard and the heat radiator; wherein the step of fabricating the heat radiator comprises the steps of: fabricating heat radiating bristles; forming insertion holes in the heat

radiating base; and fixing the heat radiating bristles to the insertion holes.

[0021] The step of fixing the heat radiating bristles to the insertion holes is performed by way of tight fit or rivet.

[0022] The step of fabricating the heat radiating bristles is performed by one of die casting and insert injection molding.

[0023] The step of fabricating the heat radiating bristles further includes a step of fabricating caps of the heat radiating bristles, and the step of fabricating the caps of the heat radiating bristles is performed by insert injection molding.

Advantageous Effects

[0024] The brush having a heater embedded therein according to some embodiments of the present invention can groom and care the hair by merely brushing the hair due to heat from the bristles of the brush. Further, it is possible to prevent the occurrence of a safety accident such as burn by forming a guard at the edge of the bristles.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025]

FIG. 1 is a block diagram of a brush having a heater embedded therein according to some embodiments of the present invention.

FIG. 2 is an exploded perspective view of the brush having a heater embedded therein in FIG. 1.

FIG. 3 is a perspective view of the body of the brush having a heater embedded therein in FIG. 1.

FIG. 4 is a perspective view of a guard of the brush having a heater embedded therein in FIG. 1.

FIG. 5 is a perspective view of a heat radiator of the brush having a heater embedded therein in FIG. 1.

FIGS. 6A and 6B are views for explaining fastening types of heat radiator, where a heat radiating bristle is fastened to the heat radiating base by a rivet in FIG. 6A and by tight fit in FIG. 6B.

FIG. 7 is a view for illustrating the tips of the heat radiating bristles in FIG. 5.

FIG. 8 is a flowchart illustrating a process of manufacturing a brush having a heater embedded therein according to some embodiments of the present invention.

DESCRIPTION OF EMBODIMENTS

[0026] Hereinafter, a brush having a heater embedded therein according to some embodiments of the present invention will be described with reference to the accompanying drawings.

[0027] FIG. 1 is a block diagram of a brush having a heater embedded therein according to an embodiment of the present invention, FIG. 2 is an exploded perspective view of the brush having heater embedded therein in FIG. 1, and FIGS. 3 to 5 are perspective views of parts of the brush having heater embedded therein in FIG. 1.

[0028] Referring to FIG. 1, the brush having a heater embedded therein includes a body 110, a guard 130, a heater 150, and a heat radiator 170.

[0029] Hereinafter, the above elements will be described in detail.

[0030] The body 110 includes a power input 111, an alarm 113, and a cover 115.

[0031] The power input 111 receives power from the outside power source and supplies power to the heater 150 so that the heater 150 can operate.

[0032] The alarm 113 may be configured by an LED or the like and may display whether the power is connected, the power is on or off, and the heater reaches to a temperature suitable for hair care.

[0033] The cover 115 blocks the heat generated by the heater 150 and prevents a safety accident such as burn during the use of the brush.

[0034] The guard 130 includes a guard comb 131 and a guard base 133 to which the guard comb 131 is fastened. The guard comb 131 is in the form of a plurality of round bars having a predetermined length and thickness and formed around the edge of the guard of the brush.

[0035] The guard base 133 serves to fix the guard comb 131 and to block heat generated from the heater 150. For this purpose, the guard base 133 is desirably formed of heat resistant plastic materials such as polysulfone (PSU), polyethersulfone (PES), polyetherimide (PEI), polyetheretherketone (PEEK) and polyphthalamide, or is formed of a material having a low heat transfer coefficient and excellent heat resistances such as polycarbonate (PC), nylon resin, or the like.

[0036] The tips of the round bars of the guard comb 131 may be formed to have a spherical head so as to provide a massage effect while preventing damage to the skin when the hair is brushed. It may also be formed of a heat resistant plastic material such as polysulfone (PSU), polyethersulfone (PES), polyetherimide (PEI), polyetheretherketone (PEEK) and polyphthalamide.

[0037] In another embodiment of the present invention, the guard comb 131 may be formed of an elastic heat resistant plastic material such as polycarbonate (PC), polyamide or the like. By using an elastic material, it is possible to prevent breakage of the guard comb 131 during use of the brush. Particularly, nylon 6 and nylon 66 are widely used in the case of nylon resin, which is an aliphatic polyamide polymer. Nylon resin has excellent mechanical properties, excellent friction and wear characteristics compared to other engineering plastics, and both self-lubricating and self-extinguishing properties. Nylon resin has excellent composite effect by reinforcing agent such as glass fiber, carbon fiber and the like or a filler, which is excellent in application to the guard comb of the present invention.

[0038] Further, in another embodiment of the present

invention, the guard comb 131 may be formed of metal to prevent the possibility of breakage.

[0039] The spacing among a plurality of round bars formed as the guard combs is preferably 3-6 mm. If the spacing is smaller than that, it is difficult to care for tangled hair. If the spacing is larger than that, the possibility of a safety accident may increase since the user may touch the radiator 170 with hands.

[0040] Although the guard 130 and the body 110 are shown as separate parts in the figures, they may be formed as a single integrated part.

[0041] A heater 150 may be formed in a space between the body 110 and the heat radiator 170. The heater 150 may be a PTC (Positive Temperature Coefficient Resistance) heater having its own temperature control capability to prevent overheating. Since the PTC heater does not generate heat beyond a certain temperature, a separate temperature control device such as a bimetal is not required, and thus the brush can be made compact and lightweight.

[0042] The heat radiator 170 includes a plurality of heat radiating bristles 171 formed of a metal having an excellent thermal conductivity and a heat radiating base 173 for fixing the heat radiating bristles thereto.

[0043] The heat radiating bristles 171 and the heat radiating base 173 are preferably made of a metal so that the heat generated by the heater 150 can be efficiently transferred thereto.

[0044] It is preferable that the length of the heat radiating bristles 171 is shorter than the length of the guard comb 151 by 1 to 2 mm so that the heat radiating bristles 171 do not directly contact the skin. The structure of the heat radiator 170 will be described in detail below.

[0045] The heat radiating base 173 may be formed to include a platinum (Pt) catalyst for antibacterial and deodorization. The heat generated from the heater 150 is transferred to the platinum catalyst, so that the antibacterial action can be performed. That is, the heat generated in the heater 150 heats the platinum catalyst layer, and the platinum catalyst is activated so that the antibacterial function can proceed. After forming a metal oxide layer on the heat radiating base 173, a plurality of nano holes are formed in the metal oxide layer to form a platinum catalyst on the surface of the nano hole. When contaminated air including bacteria inflows into the nano holes, the decomposition reaction proceeds by the platinum catalyst formed on the surface of the nano holes.

[0046] FIGS. 6A and 6B are views for explaining fastening types of heat radiator, where heat radiating bristles 171 are fastened to the heat radiating base 173 by rivet in FIG. 6A and by tight fit in FIG. 6B.

[0047] A rivet is a kind of fastening parts. It is inserted into a hole and its head is hammered to change its form to fix itself. According to the embodiment of FIG. 6A, after the heat radiating bristle 171 is inserted into the hole of the heat radiating base 173, a force F is applied to a portion of the rivet protruding on the opposite side of the heat radiating bristle 171, and the heat radiating bristle 171 can be fastened to the heat radiating base 173. Further, instead of forming the rivet head at the protruding portion on the opposite side of the heat radiating base 173, the rivet may be fastened to the heat radiating base 173 by welding or soldering.

[0048] Referring to FIG. 6B, an insertion hole corresponding to the fastening portion of the heat radiating bristle 171 is formed in the radiating base 173. The insertion hole of the radiating base 173 is tight fitted with the fastening portion of the heat radiating bristle 171 and thus heat radiating base 173 and the heat radiating bristle 171 may be coupled to each other. As a structure for implementing a tight fit, the diameter of the fastening portion of the heat radiating bristle 171 is changed to have an oblique shape, but the shape is not limited thereto. Using the tight fit structure, the fastening structure can be simplified, the manufacturing process can be simplified, and even if heat is applied, the heat radiating base and the heat radiating bristles can come into contact with each other and expand or contract simultaneously and thus the possibility of decoupling is blocked.

[0049] FIG. 7 is a view for explaining the tip of the heat radiating bristle 171 fastened to the heat radiating base 173.

[0050] Referring to FIG. 7, the tip may be formed to have a spherical head to reduce irritation to the skin during use of the brush. The spherical head can be formed by covering the heat radiating bristle made of a metal having a high heat transfer coefficient with a cap made of a heat resistant plastic having a low heat transfer coefficient.

[0051] FIG. 8 is a flowchart for explaining a manufacturing process of a brush having a heater embedded therein according to an embodiment of the present invention.

[0052] The manufacturing process according to the embodiment of the present invention comprises the steps of: fabricating a body and a guard by injection molding, fabricating a heat radiator, fixing a heater to a space between the body and the guard, and assembling the body, the guard and the heat radiator.

[0053] Referring to FIG. 8, the step of fabricating the heat radiator during the manufacturing process comprises the steps of: fabricating a heat radiating base S810, fabricating heat radiating bristles S820, and fastening the heat radiating bristles to the heat radiating base S830.

[0054] In step S810, insertion holes for fixing the heat radiating bristles to the heat radiating base 173 are formed at predetermined constant intervals. The insertion hole may be formed in a through-hole shape passing through the heat radiating base.

[0055] In step S810, after the steps of coating a metal oxide layer on the heat radiating base 173 and forming nano holes, a step of forming a platinum catalyst on the nano holes may be further performed.

[0056] In step S820, heat radiating bristles for inserting into the insertion holes are prepared. Each heat radiating bristle can be manufactured by any one of die casting

and metal insert injection.

[0057] Metal insert injection is a type of insert injection molding, which is an injection molding method that integrates plastic parts of heterogeneous, unusual colored or non-plastic such as metal, electric wire, magnet, etc. in a mold. This method can obtain a molded article having characteristics that are difficult to obtain by plastic alone, and its application field is becoming more and more widespread. Metal and plastic integrated products are the majorities of metal insert injection articles, since it is possible to make high value added product by combining the rigidity, conductivity, surface treatment property of the metal and insulating, coloring, flexibility, rigidity and workability of plastic while reducing the time and cost of the manufacturing process. In this embodiment, by covering the surface of the metal which can be used as the heat radiating bristle with a plastic material, it is possible to prevent excessive heat from being directly transferred to the skin, and there is an advantage that a separate plastic cap assembling process is unnecessary. However, the heat transfer efficiency may be somewhat lowered.

[0058] Die casting is a casting method in which molten metal is injected into a precisely machined steel die to exactly match the required casting shape to obtain the same casting as the die. Since the dimensions are accurate, there is little need for finishing treatment. Excellent mechanical properties and mass production are available and thus it is being applied in a wide range of fields. In the present embodiment, it is easy to make a structure capable of adding a plastic cap to the tip of the heat radiating bristle when the heat radiating bristles are manufactured by the die casting process. The portion of the brush that comes into contact with the hair is formed of a metal having excellent thermal conductivity, and the efficiency of the heat transfer to the hair is also excellent.

[0059] In the step S830, the step of fastening the heat radiating bristles to the heat radiating base may be performed by the tight fit method or the rivet / welding method as described with reference to FIG. 6A and FIG. 6B.

[0060] While the present invention has been described in connection with what is presently considered to be practical exemplary embodiments, it is to be understood that the invention is not limited to the disclosed embodiments, but, on the contrary, It will be understood by those skilled in the art that various changes in the form and details may be made therein without departing from the scope of the present invention. Although specific terms have been employed herein, they are used for purposes of describing the invention only to those of ordinary skill in the art and are not used to limit the scope of the invention as defined in the claims.

Claims

1. A brush having a heater embedded therein **characterized by**:

   a body including a power input, an alarm and a cover;

   a guard including a guard comb having a plurality of round bars and a guard base for fixing the guard comb thereto;

   a heater; and

   a heat radiator including a plurality of heat radiating bristles for transmitting heat generated by the heater, and a heat radiating base for fixing the heat radiating bristles thereto.

2. The brush having a heater embedded therein according to claim 1, wherein:

   the guard comb is formed at an edge of the brush and surrounds the heat radiator.

3. The brush having a heater embedded therein according to claim 2, wherein:

   the guard comb is formed of heat resistant plastic.

4. The brush having a heater embedded therein according to claim 3, wherein:

   the guard comb is formed of polycarbonate (PC), polyamide or a combination thereof.

5. The brush having a heater embedded therein according to claim 1, wherein:

   the guard base is formed of heat resistant plastic.

6. The brush having a heater embedded therein according to claim 5, wherein:

   the guard base is formed of polycarbonate (PC), polyamide or a combination thereof.

7. The brush having a heater embedded therein according to claim 1, wherein:

   the heat radiating bristles are formed of metal.

8. The brush having a heater embedded therein according to claim 7, wherein:

   each of the heat radiating bristle further includes a plastic cap at the tip.

9. The brush having a heater embedded therein according to claim 1, wherein:

   the heat radiating base further includes a platinum catalyst.

10. A method of manufacturing a brush having a heater embedded therein, comprising the steps of:

fabricating a body and a guard by injection molding;
fabricating a heat radiator;
fixing a heater in a space between the body and the guard; and
assembling the body, the guard and the heat radiator;
wherein the step of fabricating the heat radiator comprises the steps of:

fabricating heat radiating bristles;
forming insertion holes in the heat radiating base; and
fixing the heat radiating bristles to the insertion holes.

11. The method of manufacturing a brush according to claim 10, wherein:

the step of fixing the heat radiating bristles to the insertion holes is performed by way of tight fit or rivet.

12. The method of manufacturing a brush according to claim 10, wherein:

the step of fabricating the heat radiating bristles is performed by one of die casting and insert injection molding.

13. The method of manufacturing a brush according to claim 10, wherein:

the step of fabricating the heat radiating bristles further includes a step of fabricating caps of the heat radiating bristles, and the step of fabricating the caps of the heat radiating bristles is performed by insert injection molding.

FIG. 1

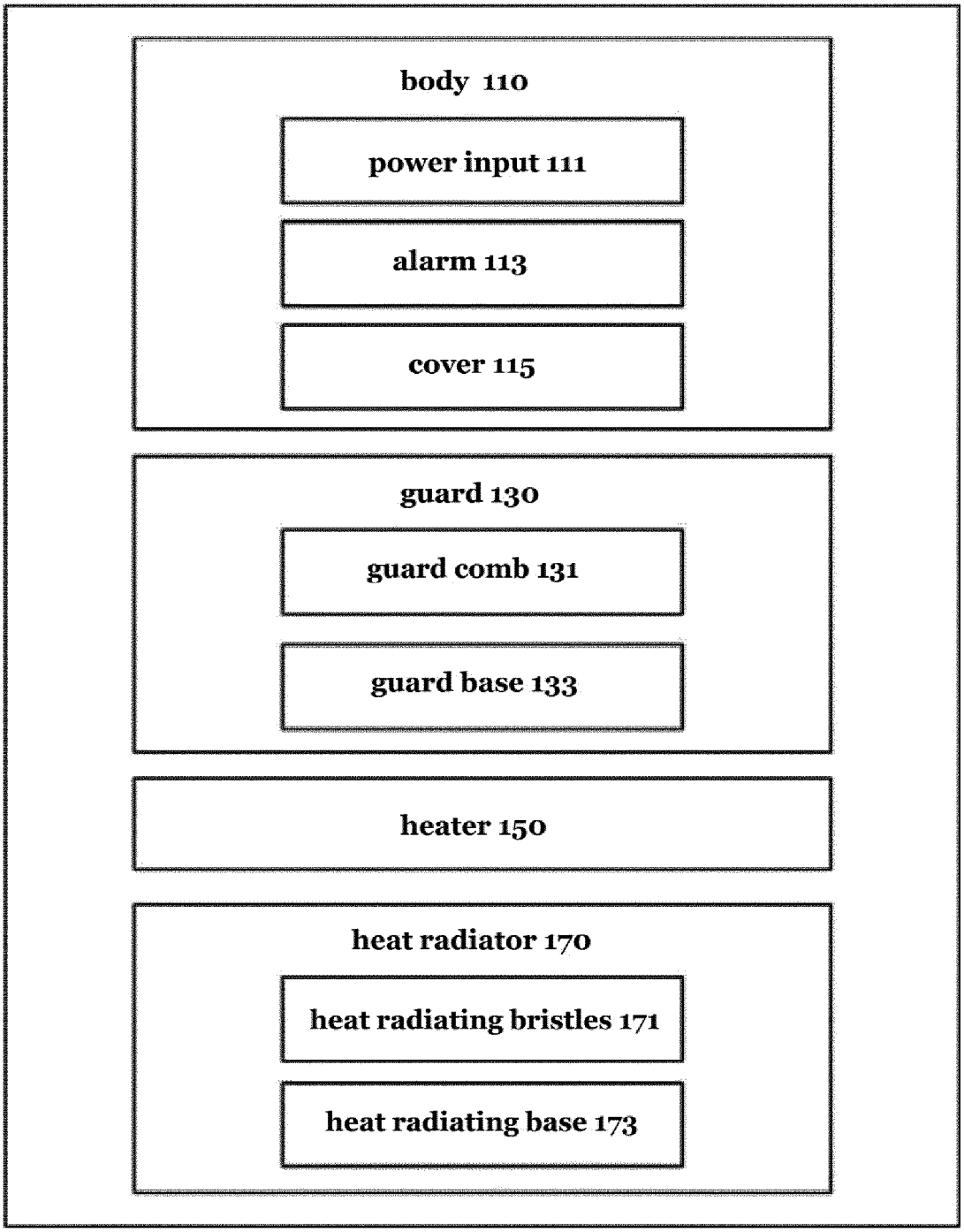

body 110
power input 111
alarm 113
cover 115
guard 130
guard comb 131
guard base 133
heater 150
heat radiator 170
heat radiating bristles 171
heat radiating base 173

FIG. 2

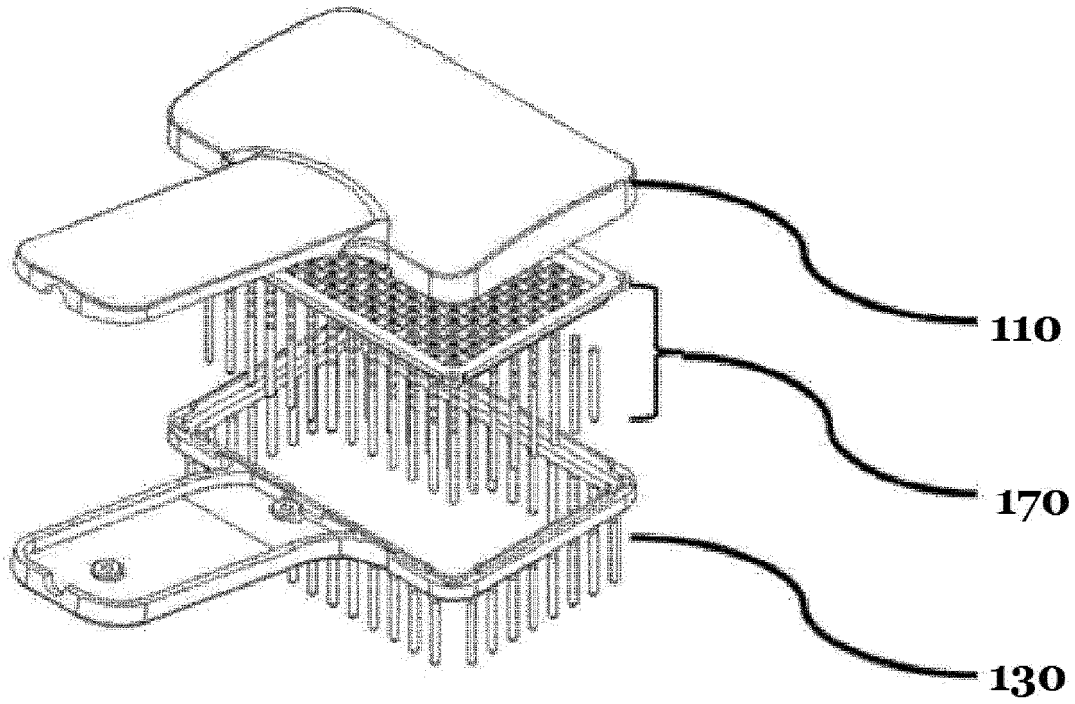


FIG. 3

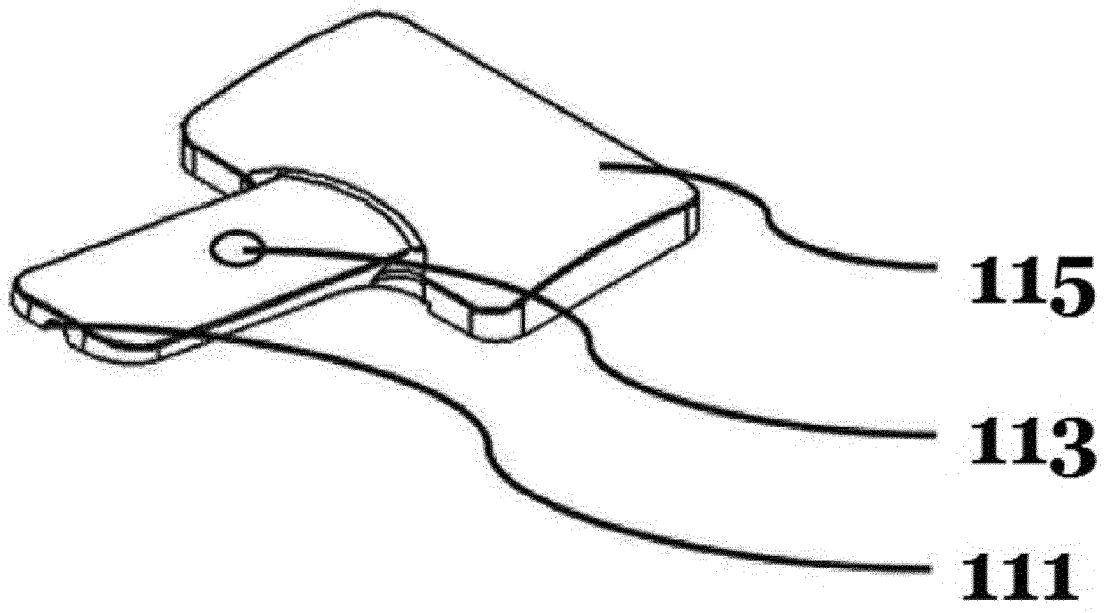


FIG. 4

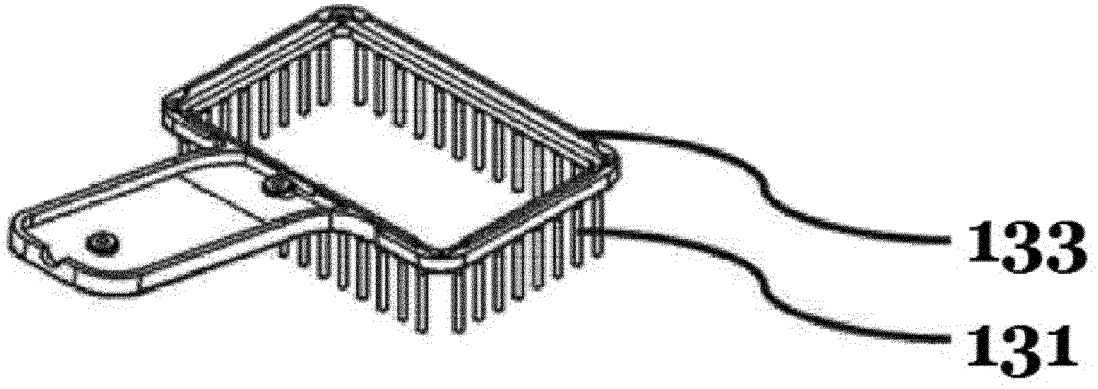


FIG. 5

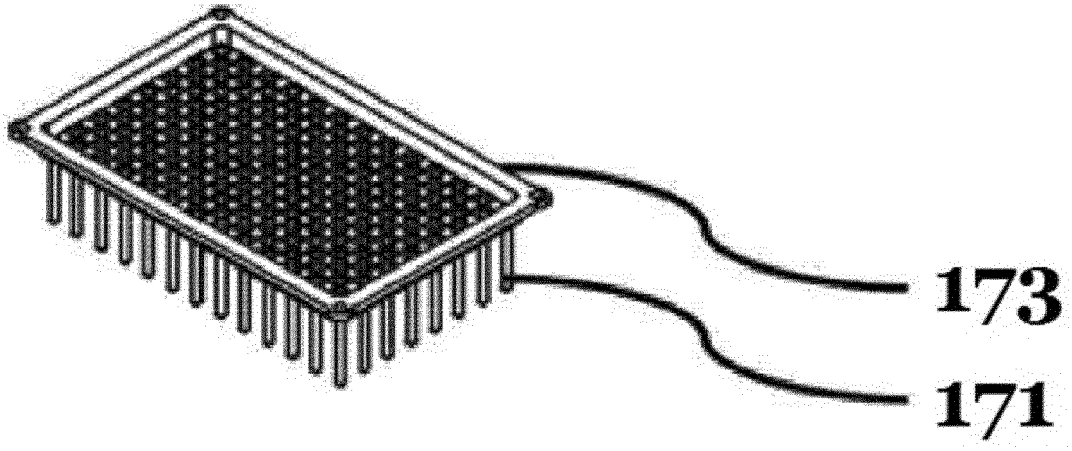


FIG. 6A

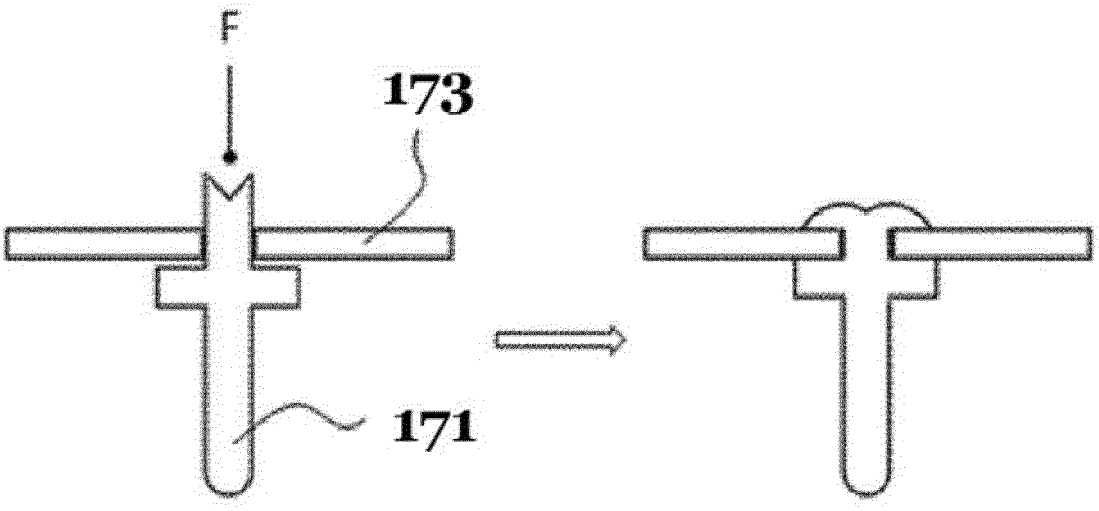


FIG. 6B

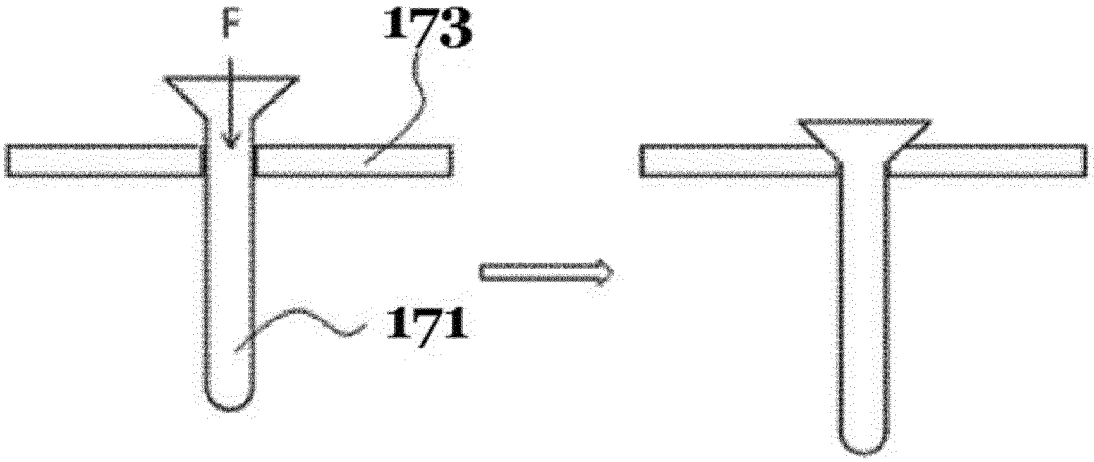


FIG. 7

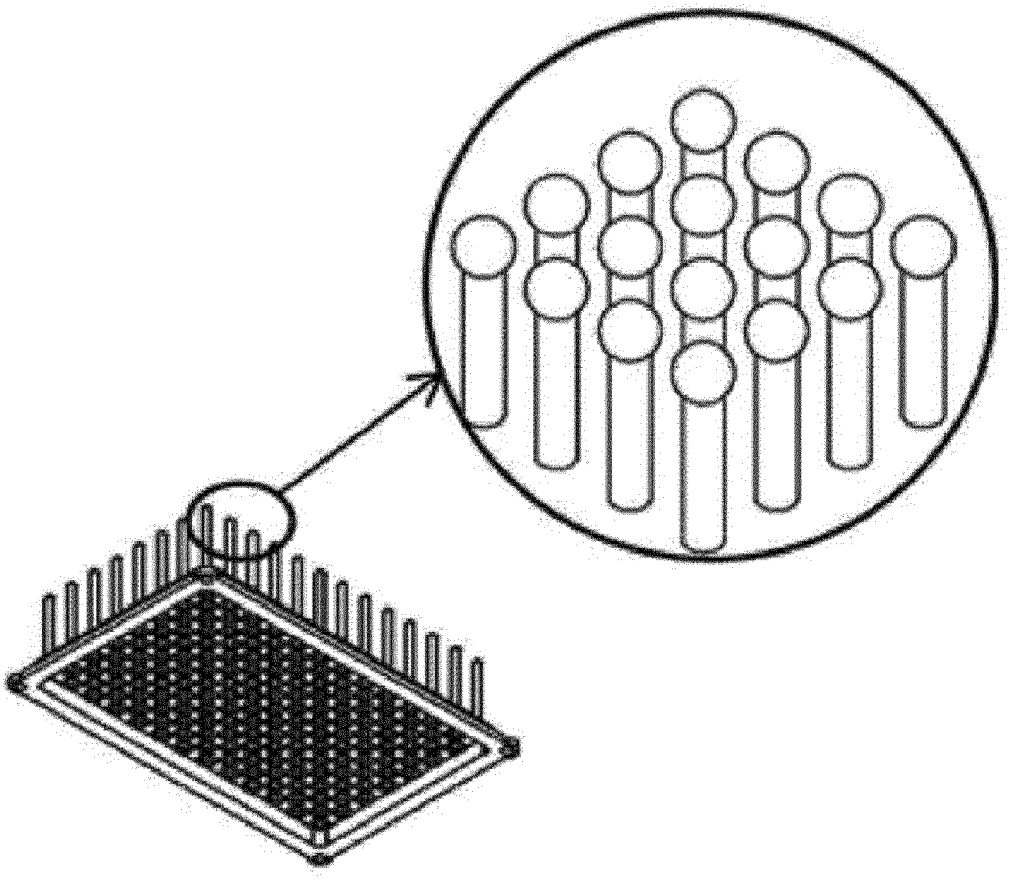
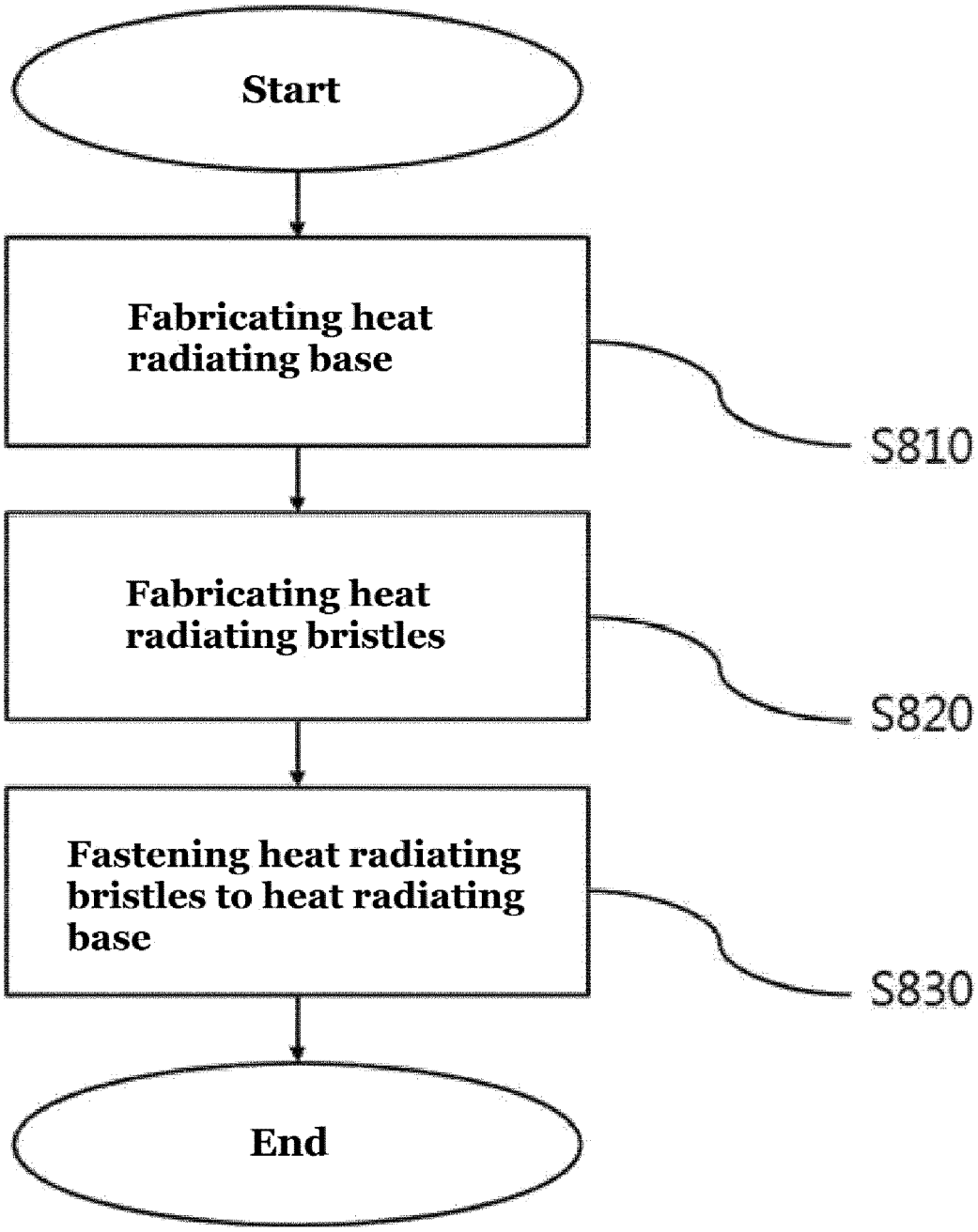


FIG. 8


Start
Fabricating heat radiating base
S810
Fabricating heat radiating bristles
S820
Fastening heat radiating bristles to heat radiating base
S830
End

INTERNATIONAL SEARCH REPORT

International application No.
PCT/KR2016/004792

A. CLASSIFICATION OF SUBJECT MATTER

A46B 11/08(2006.01)i, A46B 9/02(2006.01)i, A46D 1/00(2006.01)i, A46D 1/04(2006.01)i, A46D 3/00(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)

A46B 11/08; A45D 24/02; A45D 24/00; A45D 24/36; A45D 1/18; A45D 20/48; A45D 1/16; A45D 1/04; A46B 9/02; A46D 1/00; A46D 1/04; A46D 3/00

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 brush, heater, heat radiation, heat radiation, heat-resistant plastics, injection molding

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	KR 10-2006-0134508 A (K.I.C.A INC.) 28 December 2006 See claim 1; paragraphs [0032]-[0035], [0041]; figures 1-6.	1-8
Y		9-13
Y	KR 10-2011-0100023 A (SIT CO., LTD.) 09 September 2011 See claim 2; paragraphs [0028]-[0031]; figures 3-4, 6.	9-13
A	KR 10-2014-0007735 A (PARK, Eun Joo) 20 January 2014 See the entire document.	1-13
A	KR 20-0262444 Y1 (CHO, Hyung Chul) 18 March 2002 See the entire document.	1-13
A	KR 10-2012-0090486 A (OH, Tae Hoon et al.) 17 August 2012 See the entire document.	1-13

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
29 JULY 2016 (29.07.2016)	**08 AUGUST 2016 (08.08.2016)**
Name and mailing address of the ISA/KR Korean Intellectual Property Office Government Complex-Daejeon, 189 Seonsa-ro, Daejeon 302-701, Republic of Korea Facsimile No. 82-42-472-7140	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/KR2016/004792

Patent document cited in search report	Publication date	Patent family member	Publication date
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