(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 1 964 537 A1**

(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
03.09.2008 Bulletin 2008/36

(51) Int Cl.:
A61H 7/00 *(2006.01)*

(21) Application number: **07110217.2**

(22) Date of filing: **13.06.2007**

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC MT NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(30) Priority: **28.02.2007 JP 2007048635**

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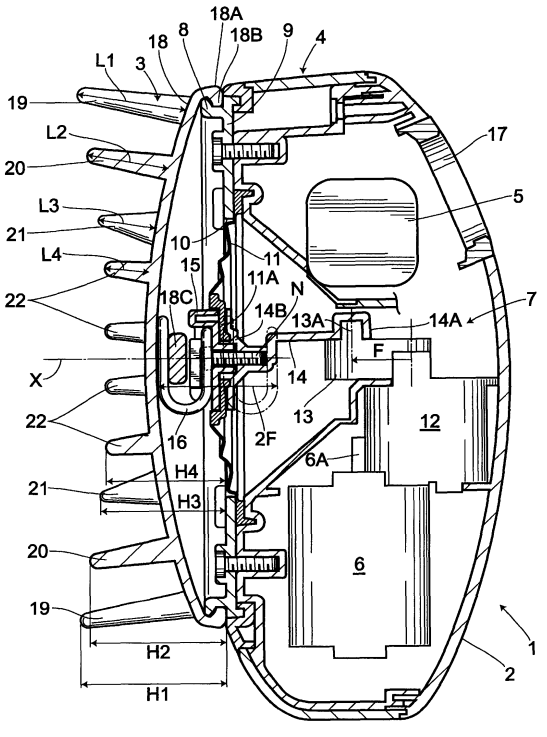
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(54) Massaging device

(57) The massaging device (1) of the present invention has the treating section (3) including: a base portion (18) made of a flexible and elastic material; and a plurality of projections (19-22) protruded orthogoinally from a surface of the base portion (18). The treating section (3) is detachably retained to the drive section, e.g. the frame (8) and the reciprocating drive means (7) of the main body (2), under a condition where the orientation of the treating section (3) relative to the drive section (2) is fixed. The base portion (18) is repeatedly deflected by the reciprocating drive means (7) in a direction perpendicular to the surface. Accordingly, the scalp (S) may be washed and massaged effectively by the respective projections (19-22). Furthermore, a phantom surface connecting distal ends of a plurality of the projections (19-22) under an unloaded condition is always concave regardless of any position of the reciprocating drive means (7), when the treating section (3) is attached to the main body (2). Thus, a plurality of the distal ends of the projections (19-22) can be pressed smoothly over a convex curvature such as the scalp (S). Accordingly, there is provided a massaging device for performing a scalp massage and a scalp wash at a treated area gently and effectively, when a hair wash and a scalp massage are done.

FIG.3



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Description

BACKGROUND OF INVENTION

Field of the Invention

[0001] The present invention relates to a power-driven massaging device, more particularly, relates to a massaging device utilized for a massage and a wash for a scalp of a human body.

Background of the invention

[0002] Conventionally, as this kind of the massaging device, double-purpose brushes for massaging and washing electrically are known, for example, in Japanese un-examined patent publication No. 2001-258974. In the brushes, a vibratory head is attached via an elastic member to a casing containing a motor, and a motor shaft of the motor is protruded in the vibratory head, and an oscillator is eccentrically attached to the motor shaft. And further a brush section made of a flexible material is attached to a side surface of the vibratory head. The double-purpose brush comprises a brush body section serving as a base portion formed in a disk-shape and needle-like pieces serving as a number of projections protruded from a side surface of the brush body section. When this double-purpose brush is used, a user, first, holds the casing to place the brush section over his/her scalp and then activates a motor. As a result, vibration caused by the eccentric rotation of the oscillator built in the vibratory head, is transferred to the scalp via the vibratory head and the brush section. The brush section is made of such a flexible material that debris and sebum in the pores are removed without injuring the scalp while a massage is performed.

[0003] According to these conventional massaging devices, for example when scalp massage is performed at hair wash, the vibration caused by the eccentric rotation of the oscillator built in the vibratory head, is transferred to the scalp via the vibratory head and the brush section made of the flexible material. The brush section, however, simply vibrates against the scalp, so that massage cannot be sufficiently performed on the scalp etc. and the debris of the scalp can not be sufficiently removed, either.

SUMMARY OF THE INVENTION

[0004] Therefore, it is an object of the present invention to solve the above-described problems and provide a massaging device for performing a scalp massage and a scalp wash at a treated area gently and effectively by a treating section, when a hair wash and a scalp massage are done.

[0005] According to a first aspect of the present invention, there is provided a massaging device having a drive section and a treating section operated by the drive section, the treating section including: a base portion made of a flexible and elastic material; and a plurality of projections protruded from the base portion, wherein the base portion of the treating section is detachably attached to a frame of the drive section, and a reciprocating drive means for deflecting the base portion in a direction intersecting with a central surface of the base portion is disposed in the drive section, while a periphery of the base portion of the treating section are retained under a condition where its orientation relative to the drive section is fixed, and wherein a phantom surface connecting distal ends of a plurality of the projections under an unloaded condition is always concave regardless of any position of the reciprocating drive means, when the treating section is connected to the frame and the reciprocating drive means. According to the above configuration, the massaging device can deflect a central region of the base portion in a direction intersecting with the central surface of the base portion by the reciprocating drive means, keeping the periphery of the base portion of the treating section being retained in the frame. Thus, a plurality of the projections are repeatedly opened and closed with the complemental relation with the other and when these projections are abutted on a scalp, the scalp may be washed and massaged effectively. Furthermore, the phantom surface connecting distal ends of a plurality of the projections is always concave regardless of any position of the reciprocating drive means. Thus, a plurality of the distal ends of the projections can be pressed smoothly over a convex curvature such as the scalp.

[0006] According to a second aspect of the present invention, there is provided a massaging device according to the foregoing aspect, wherein a shape of the base portion corresponding to the outermost protruded position of the reciprocating drive means is the same as its shape under a natural condition or a shape it takes when drawn relatively inwardly, when the treating section is connected to the frame and the reciprocating drive means. A restoring force due to the resilience of the base portion is exerted on the reciprocating drive means, and thus the reciprocating drive means is continuously pushed outwardly except when the base portion is restored into a natural condition. Accordingly, when the reciprocating drive means pushes the base portion outwardly, the base portion is restored at the same time as being pushed by the reciprocating drive means. Thus, the base portion can be restored substantially uniformly, without being pressed obliquely against the elastic force thereof, to provide a good performance in massaging the scalp and a treated area.

[0007] According to a third aspect of the present invention, there is provided a massaging device according to one of the foregoing aspects, wherein the base portion of the treating section is formed to be outwardly convex under a natural condition. Accordingly, when the reciprocating drive means draws the base portion, the reciprocating drive means just has to have the base portion deflected against own elasticity of the base portion. Since

there is no necessity to expand the base portion in its horizontal direction, the reciprocating drive means can deflect the base portion of the treating section with a small load, thereby accomplishing a reduction of power consumption.

[0008] According to a fourth aspect of the present invention, there is provided a massaging device according to the third aspect, wherein a shape of the base portion corresponding to the innermost drawn position of the reciprocating drive means is a shape having a center region more concave than a circumferential region under a condition where the treating section is connected to the frame and the reciprocating drive means. The massaging device can draw and deform the convex base portion so as to have a shape with a center region more concave than a circumferential region, and thereby it can repeatedly deflect the base portion between the curved convex position and the curved concave position. Accordingly, the projections formed on the base portion can be moved greatly to effectively perform the massage over the scalp and a treated area.

[0009] According to a fifth aspect of the present invention, there is provided a massaging device according to one of the foregoing aspects, wherein a plurality of the projections are arranged to have lengths incrementally lengthening from a center toward a periphery of the base portion. Consequently, the projections in the periphery side have greater flexibility, and each of the projections arranged from a center toward a periphery of the base portion gives different stimuli onto the scalp respectively, and thus more adequate massage and wash of the scalp are attained. Furthermore, the phantom surface connecting distal ends of a plurality of the projections is always concave regardless of any position of the reciprocating drive means, when the treating section is attached to the frame. Thus, a plurality of the distal ends of the projections can be further pressed smoothly over a convex curvature such as a head.

[0010] According to a sixth aspect of the present invention, there is provided a massaging device according to one of the foregoing aspects, wherein, the surface of the base portion has, in a front view, a substantially circular shape, or a substantially oval shape. Thus, a concave curve of the phantom surface connecting distal ends of a plurality of the projections under a natural condition of the base portion has a shape corresponding to a convex curve such as a parietal region of a human body. Accordingly, a plurality of the distal ends of the projections can be further pressed smoothly over a convex curvature such as the head.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] The invention will be more readily understood by reference to the following description, taken with the accompanying drawings, in which:

FIG 1 is an elevational view showing a massaging device of one embodiment according to the present invention;

FIG 2 is a right side view showing the massaging device of FIG 1;

FIG 3 is a sectional view taken away along A-A line of FIG 1;

FIG 4A is an illustrative drawing for unloaded operation of the massaging device of FIG 1, whose base portion is positioned to be most protruded.

FIG 4B is an illustrative drawing for unloaded operation of the massaging device of FIG 1, whose base portion is positioned to be most drawn.

FIG 5A is an illustrative drawing for loaded operation of the massaging device of FIG 1, whose base portion is positioned to be most protruded.

FIG 5B is an illustrative drawing for loaded operation of the massaging device of FIG 1, whose base portion is positioned to be most drawn.

DESCRIPTION OF THE PREFERRED EMBODIMENT

[0012] Next is a detailed description of preferred embodiments according to the present invention with reference to the accompanying drawings of FIGs. 1-5. In the illustrative embodiment, the orientation of the massaging device is defined on the basis of its position shown in FIGs. 1-3. Numeral 1 is a massaging device of the present invention. A massaging device 1 comprises a main body 2 serving as a drive section and a treating section 3 detachably held by the main body 2.

[0013] The main body 2 is configured to include an outer shell 4, for example made of synthetic resin, so that the outer shell can accommodate a secondary battery 5, a control circuit (not shown), an electric motor 6 actuated by the secondary battery 5 and the control circuit, and a reciprocating drive means 7 for converting the rotatory motion of a drive shaft 6A of the electric motor 6 into the reciprocatory motion. A mounting plate 9, which is oval in a front view and has a frame 8 for receiving the treating section 3, is fixed onto the outer shell 4. In the central region of the mounting plate 9, a circular window opening 10, which penetrates the mounting plate, is formed. An extensible cover 11 covering the window opening 10 is disposed. The extensible cover 11 is made of a flexible accordion plate to provide water-tightness for the window opening 10. The reciprocating drive means 7 includes a crank mechanism 13 connected to the drive shaft 6A of the electric motor 6 via a speed reduction gear mechanism 12, and a connecting rod 14, having a proximal end 14A which is rotatably coupled to an eccentric shaft 13A of the crank mechanism 13, for converting the rotary motion of the eccentric shaft 13A into the reciprocal motion. A thickened central region 11A of the cover 11 is sandwiched between a distal end 14B of the connecting rod 14 and a connecting member 15, which are secured by a screw N. A hook 16 is mounted outside of the connecting member 15. The hook 16 is constituted to reciprocate in a direction which it protrudes and recedes with respect

to the main body 2 by the crank mechanism 13 in accordance with the rotation of the electric motor 6. The accordion extensible cover 11 is deflected keeping the watertightness, in accordance with the reciprocal motion of the hook 16. The amplitude of the hook 16 is twice as the eccentric distance F from a central axis of the crank mechanism 13 to the eccentric shaft 13A (i.e. 2F). In the outer shell 4, a switch 17 for operating the electric motor 6 is disposed.

[0014] The treating section 3 is integrally made of soft synthetic resin or the like having flexibility and elasticity. The treating section 3 comprises a base portion 18 and four different kinds of projections 19-22 which are provided on the base portion 18. The base portion 18 has a substantially oval shape in front view, and is formed so that in its normal position, the center thereof has a convex curved shape smoothly raised outwardly. A rib 18A is integrally formed along the entire outer circumference of the base portion 18, and inside the rib 18A, an engaging portion 18B is formed so as to be engaged with and fixed on the frame 8 of the mounting plate 9 in the main body 2. The "fixing" includes the meaning to secure something allowing little movement. On a rear surface of the base portion 18, a hook receiving portion 18C is formed for receiving the hook 16 in the center of the base portion 18.

[0015] On the outer periphery of the base portion 18, a plurality of first projections 19 are arranged annularly with respect to a central axis line X of the base portion 18. On the inner side of the first projections 19, a plurality of second projections 20 are arranged annularly with respect to the central axis line X. In addition, on the inner side of the second projections 20, a plurality of third projections 21 are arranged symmetrically with respect to the central axis line X. The third projections 21 are configured so as to have an axisymmetrical placement of two sets of the projections with an arcuate arrangement. Furthermore, on the inner side of the third projections 21, a plurality of fourth projections 22 are arranged annularly with respect to the central axis line X. The above-described projections 19-22 have lengths L1-L4, respectively, so as to be defined as L1>L2>L3>L4. The first, second, and fourth projections 19, 20, 22 are shaped into a rod which is relatively tapered toward its distal end that are rounded (i.e. a cone with a smaller apex angle), while the third projections 21 are shaped into a cone with a relatively larger apex angle. The distal ends of the third projections 21 are shaped to be sharper than the ones of the other projections 19, 20, 22, while the proximal ends of the third projections 21 are shaped to be thicker than the ones of the other projections 19, 20, 22. Accordingly, although the third projections 21 can be deflected by an external force, it is more difficult for the third projections 21 to be deflected than the other projections 19, 20, 22.

[0016] When the engaging portion 18B of the treating section 3 is engaged with the frame 8 and the hook receiving portion 18C is engaged with the hook 16 to connect the treating section 3 with the frame 8 and the reciprocating drive means 7, under the condition that the hook 16 is positioned at a bottom dead center, the base portion 18 is shaped same as that in its normal position. On the other hand, under the condition that the hook 16 is positioned at a top dead center, the base portion 18 has a shape with a center region more concave than a circumferential region. (In the paragraph, 'a bottom dead center' means a position of the hook 16 most protruding outwardly; and 'a top dead center' means to a position of the hook 16 most retracting inwardly, for convenience.) In a condition of the hook 16 positioned at the bottom dead center, i.e. when the center of the base portion 18 is most protruding outwardly, the first projections 19 have the highest heights, while the fourth projections 22 have the lowest ones. Accordingly, a phantom curved surface connecting top points of these projections 19-22 is shaped in a concave. Further, on the treating section 3 attached to the frame 8, the first projections 19 are disposed so as to be always greater in its heights H1 measured from the mounting plate 9 than the second projections 20 in its heights H2 despite drive conditions of the reciprocating drive means 7 (i.e. if the hook 16 is positioned at any of these: the bottom dead center; the top dead center; or a position therebetween.) In the same manner, the second projections 20 are disposed so as to be always longer in its heights H2 than the third projections 21 in its heights H3, the third projections 21 are disposed so as to be always bigger in its heights H3 than the fourth projections 22 in its heights H4 (H1>H2>H3>H4).

[0017] Meanwhile, in FIGs. 3-5, some of the projections 19-22 are omitted to make a clear description of preferred embodiments according to the present invention since, if all actual projections 19-22 are drawn on the FIGs., many lines are crossed on the drawings, thereby some difficulties in describing may be caused.

[0018] Next is a detailed description of one embodiment according to the present invention with reference to the accompanying drawings. In the illustrative embodiment, when scalp S massage is performed at hair wash, a user first holds the treating section 3, and then hooks the hook receiving portion 18C formed at center of the rear surface of the base portion 18 of the treating section 3 with the hook 16 to engage the engaging portion 18B with the frame 8. After then, the user attaches the treating section 3 to the main body 2 and holds the main body 2 of the massaging device 1, pressing each distal end of the projections 19-22 over the scalp S. As described above, despite drive conditions of the reciprocating drive means 7, heights H1-H4 of the projections 19-22 are H1>H2>H3>H4, and a phantom curved surface connecting top points of these projections 19-22 is always shaped concave, thus each distal end of the projections 19-22 can be pressed smoothly over a convex curved surface of the scalp S.

[0019] When the switch 17 is turned on, the electric motor 6 actuated by the secondary battery 5 is activated and the drive shaft 6A of the electric motor 6 rotates.

According to the rotation of the drive shaft 6A, the crank mechanism 13 connected to the drive shaft 6A via the speed reduction gear mechanism 12 rotates and, the connecting rod 14, which is coupled to the crank mechanism 13 and the eccentric shaft 13A of the crank mechanism 13, converts the rotatory motion of the drive shaft 6A into the reciprocal motion. The connecting member 15 and the hook 16, both of which are connected to the connecting rod 14, are thus constituted to reciprocate in a direction which it protrudes and recedes with respect to the main body 2. The cover 11 is provided to keep the water-tightness for the window opening 10 of the mounting plate 9, thereby preventing water seeping into the main body 2 from the window opening 10. The extensible cover 11 is shaped as an accordion plate by a flexible material so as to deflect in accordance with the reciprocal motion of the connecting rod 14 and the connecting member 15, keeping the water-tightness for the window opening 10.

[0020] According to the reciprocal motion of the hook 16, a center region of the base portion 18 of the treating section 3 is also constituted to reciprocate in a direction which it protrudes and recedes with respect to the main body 2, as the receiving portion 18C is formed at center of the rear surface of the base portion 18 of the treating section 3 and hooked with the hook 16. The positioning of the outer periphery of the base portion 18 with respect to the main body 2 is fixed in a manner that the engaging portion 18B disposed at the outer periphery of the base portion 18 is engaged with the frame 8. Therefore, the base portion 18 is repeatedly deflected, in the orthogonal direction with respect to the surface direction of the base portion 18, between the outwardly-deflected curved convex position and the inwardly-deflected curved concave position, since the outer periphery of the base portion 18 retains fixed during the reciprocal motion of the center region of the base portion 18 in the vertical direction. The base portion 18 has the maximum amplitude location at the center thereof where the hook receiving portion 18C engaged with the hook 16 is disposed. The amplitude is twice as long as the eccentric distance F from the center of the crank mechanism 13 to the eccentric shaft 13A (i.e. 2F). Further, the base portion 18 of the treating section 3 is shaped into a convex outwardly in its normal position. When the treating section 3 is connected to the frame 8 and the reciprocating drive means 7, under the condition that the hook 16 is positioned at the bottom dead center, the base portion 18 is shaped same as that in its normal position. Based on the configuration, when the reciprocating drive means 7 pushes the base portion 18, the reciprocating drive means 7 moves as if it is pulled by a restoration motion of the base portion 18. Thus, the base portion 18 can be restored uniformly, preventing the restoration from deviating from the direction, to provide a good performance in massaging the scalp S. And, when the reciprocating drive means 7 draws the base portion 18, the reciprocating drive means 7 just has to have the base portion 18 deflected against own elasticity of the base portion 18. Since there is no necessity to expand the base portion 18 in its surface direction, the reciprocating drive means 7 can deflect the base portion 18 with a small load, thereby accomplishing a reduction of power consumption.

[0021] Each of the projections 19-22 formed integrally with the base portion 18 is moved in accordance with repeated deflections of the base portion 18 between the outwardly-protruded curved convex position and the inwardly-protruded curved concave position. Specifically, under the unloaded operation, when the hook 16 is positioned at the bottom dead center and the base portion 18 is most protruded, each distal end of the projections 19-22 is totally spaced apart from each other (in open condition). To the contrary, when the hook 16 is positioned at the top dead center and the base portion 18 is most concaved, each distal end of the projections 19-22 is totally spaced narrower to each other (in close condition). Accordingly, each of the projections 19-22 is inclined inwardly and outwardly repeatedly with respect to the central axis line X to perform a massage in a manner that the scalp S is rubbed.

[0022] Hereinafter, movement of each of the projections 19-22 during the massage of the scalp S is described. The base portion 18 is deflected repeatedly between the most outwardly-protruded curved convex position and the most inwardly-protruded curved concave position by the reciprocating drive means 7. Then, when the distal ends of the third projections 21, which are deflected relatively harder than the other projections 19, 20, 22, are pressed over the scalp S so as to constantly abut thereon, the distal ends of the third projections 21 are moved frictionally over the scalp S with slight deflection in the moving direction, so that washing and massaging on a scalp S can be performed in a manner that the scalp S is rubbed by the third projections 21. Especially, in the embodiment, the distal ends of the third projections 21 have relatively sharp-pointed shapes for applying frictional or scratched stimuli onto the scalp S, thereby providing the scalp S with a good massage and wash. When the distal ends of the first and second projections 19-20, which are longer and are deflected relatively easier than the third projections 21, are pressed over the scalp S so as to abut thereon, the distal ends of the first and second projections 19-20 are deflected widely in the moving direction in accordance with the deflection of the base portion18 repeated between the most outwardly-protruded curved convex position and the most inwardly-protruded curved concave position. At this time, restoring forces inhered in the deflected first and second projections provide the scalp S with stimuli in a kneading manner on massaging and washing. The easy deflection of the first and second projections 19-20 enables the third projections 21 to secure constant and continuous stimuli against the scalp S. This means that the third projections 21 can provide constant stimuli against the scalp S. The fourth projections 22, which are shorter than the third projections 21, abut on the scalp S in the most outwardly-

protruded curved convex position of the base portion 18, but are spaced apart from the scalp S in the most inwardly-deflected curved concave position of the base portion 18. This is caused by the reason that a curve rate of the concaved surface connecting both distal ends of the third projections 21 and of the fourth projections 22 are bigger than that of the scalp S's surface when the base portion 18 is positioned at the most inwardly-protruded curved concave position. Particularly in the embodiment, the third projections 21 are harder to be deflected than other projections, and thereby the repeats of abutting and release of the fourth projections 22 against the scalp S are encouraged. The repeats of abutting and release of the fourth projections 22 further perform a massage and wash in a manner that the scalp S is lightly tapped. The fourth projections 22 in the embodiment are easier to be deflected since they are substantially shaped into a rod with relatively a thick distal end and a thin proximal end. Therefore, when the fourth projections 22 abut on the scalp S, the fourth projections 22 can be deflected to avoid the scalp S from undue stimuli with pain. Further, since the proximal ends of the fourth projections 22 are relatively thin, the deflection of the base portion 18 is not prevented by the proximal ends of the fourth projections 22. Consequently, each of the projections 19-22 gives different stimuli onto the scalp S respectively, and thus more adequate massage and wash of the scalp S are attained.

[0023] The treating section 3 needs to be replaced when it is tainted or broken during using repeatedly. In such situation, to detach the treating section 3 from the main body 2, the user first disengages the engaging portion 18B from the frame 8, and then removes the hook receiving portion 18C from the hook 16. The massaging device 1 can be used again after attaching a new or washed-up treating section 3 to the main body 2 by following the above steps reversely.

[0024] As stated above, in the massaging device 1 of the present invention, the treating section 3 including: a base portion 18 made of a flexible and elastic material; and a plurality of projections 19-22 protruded perpendicularly from a surface of the base portion 18, is detachably retained to the drive section (e.g. the frame 8 and the reciprocating drive means 7 of the main body 2) under a condition where the orientation of the treating section 3 relative to the drive section 2 is fixed, and the base portion 18 is repeatedly deflected by the reciprocating drive means 7 in a direction orthogonal to the surface. Accordingly, the scalp S may be washed and massaged by the respective projections 19-22. Furthermore, the phantom surface connecting distal ends of a plurality of the projections 19-22 under an unloaded condition is always concave regardless of any position of the reciprocating drive means 7, when the treating section 3 is attached to the main body 2. Thus, a plurality of the distal ends of the projections 19-22 can be pressed smoothly over a convex curvature such as the scalp S.

[0025] In the massaging device 1 of the present invention, a shape of the base portion 18 corresponding to the outermost protruded position of the reciprocating drive means 7 may be the same as its shape under a natural condition or a shape drawn relatively inwardly, when the treating section 3 is connected to the frame 8 and the reciprocating drive means 7. By a restoring force due to the resilience of the base portion 18, the connecting rod 14 of the reciprocating drive means 7 is continuously pulled outwardly except when the base portion 18 is restored into a natural condition. Accordingly, when the reciprocating drive means 7 pushes the base portion 18 outwardly, the connecting rod 14 of the reciprocating drive means 7 moves as if it is pulled by a restoration motion of the base portion 18. Thus, the base portion 18 can be restored uniformly, preventing the restoration from deviating from the restorative direction, to provide a good performance in massaging the scalp S.

[0026] In the massaging device 1 of the present invention, the base portion 18 may be formed to be outwardly convex under a natural condition. Accordingly, when the reciprocating drive means 7 draws the base portion 18, the reciprocating drive means 7 just has to have the base portion 18 deflected against own elasticity of the base portion 18. Since there is no necessity to expand the base portion 18 in its surface direction, the reciprocating drive means 7 can deflect the base portion 18 with a small load, thereby accomplishing a reduction of power consumption.

[0027] The massaging device 1 of the present invention may draw and deform the convex base portion 18 of the treating section 3, connected to the frame 8 and the reciprocating drive means 7, so that the base portion 18 has a shape with a center region more concave than a circumferential region, and may repeatedly deflect the base portion 18 between the curved convex position and the curved concave position. Accordingly, the projections 19-22 formed on the base portion 18 can be moved greatly to effectively perform the massage over the scalp S.

[0028] A plurality of the projections 19-22 may be arranged to have lengths L1-L4 incrementally lengthening from a center toward a periphery of the base portion 18 (e.g. L1>L2>L3>L4). Consequently, the projections 19-22 in the periphery side have greater flexibility, and each of the projections 19-22 arranged from a center toward a periphery of the base portion 18 gives different stimuli onto the scalp S respectively, and thus more adequate massage and wash of the scalp S are attained. Furthermore, the phantom surface connecting distal ends of a plurality of the projections 19-22 is always concave regardless of any position of the reciprocating drive means 7, when the treating section 3 is attached to the frame 8. Thus, a plurality of the distal ends of the projections 19-22 can be further pressed smoothly over a convex curvature such as a head.

[0029] The surface of the base portion 18 may have, in a front view, a substantially circular shape, or a substantially oval shape. Thus, a concave curve of the phantom surface connecting distal ends of a plurality of the

projections 19-22 under a natural condition of the base portion 18 may be an inverted sphere or an inverted elliptical sphere corresponding to a convex curve such as a parietal region of a human body. Accordingly, a plurality of the distal ends of the projections 19-22 can be further pressed smoothly over a convex curvature such as the head.

[0030] Moreover, the present invention is not limited to the above exemplary embodiments, and various modifications can be made within the scope of the present invention. For example, in the above-described embodiment, the reciprocating drive means is configured so that the base portion of the treating section at the outermost protruded position is the same as its shape under a natural condition of the base portion of the treating section, when the treating section is attached to the frame and the reciprocating drive means. The reciprocating drive means may be, however, configured so that the base portion of the treating section at the outermost protruded position is a shape drawn relatively inwardly relative to its shape under a natural condition of the base portion of the treating section. In addition, in the above-described embodiment, the base portion has the substantially oval shape in a plane view, however it may have a substantially circular shape.

Claims

1. A massaging device (1) having a drive section (2) and a treating section (3) operated by the drive section (2), said treating section (3) including: a base portion (18) made of a flexible and elastic material; and a plurality of projections (19, 20, 21, 22) protruded from said base portion (18), wherein said base portion (18) of the treating section (3) is detachably attached to a frame (8) of said drive section (2), and a reciprocating drive means (7) for deflecting said base portion (18) in a direction intersecting with a central surface of said base portion (18) is disposed in said drive section (2), while a periphery of said base portion (18) of said treating section (3) are retained under a condition where its orientation relative to said drive section (2) is fixed, and **characterized in that**,
a phantom surface connecting distal ends of a plurality of the projections under an unloaded condition is always concave regardless of any position of said reciprocating drive means (7), when said treating section (3) is connected to said frame (8) and said reciprocating drive means (7).

2. The massaging device (1) according to claim 1, **characterized in that** a shape of said base portion (18) corresponding to the outermost protruded position of said reciprocating drive means (7) is the same as its shape under a natural condition or a shape it takes when it is drawn relatively inwardly, when said treating section (3) is connected to said frame (8) and said reciprocating drive means (7).

3. The massaging device (1) according to claim 1 or 2, **characterized in that** said base portion (18) is formed to be outwardly convex under a natural condition.

4. The massaging device (1) according to claim 3, **characterized in that** a shape of said base portion (18) corresponding to the innermost drawn position of said reciprocating drive means (7) is a shape having a center region more concave than a circumferential region.

5. The massaging device (1) according to any one of claims 1 to 4, **characterized in that** a plurality of said projections are arranged to have lengths incrementally lengthening from a center toward a periphery of said base portion (18).

6. The massaging device (1) according to any one of claims 1 to 5, **characterized in that** said surface of said base portion (18) has, in a elevational view, a substantially circular shape or a substantially oval shape.

FIG.1

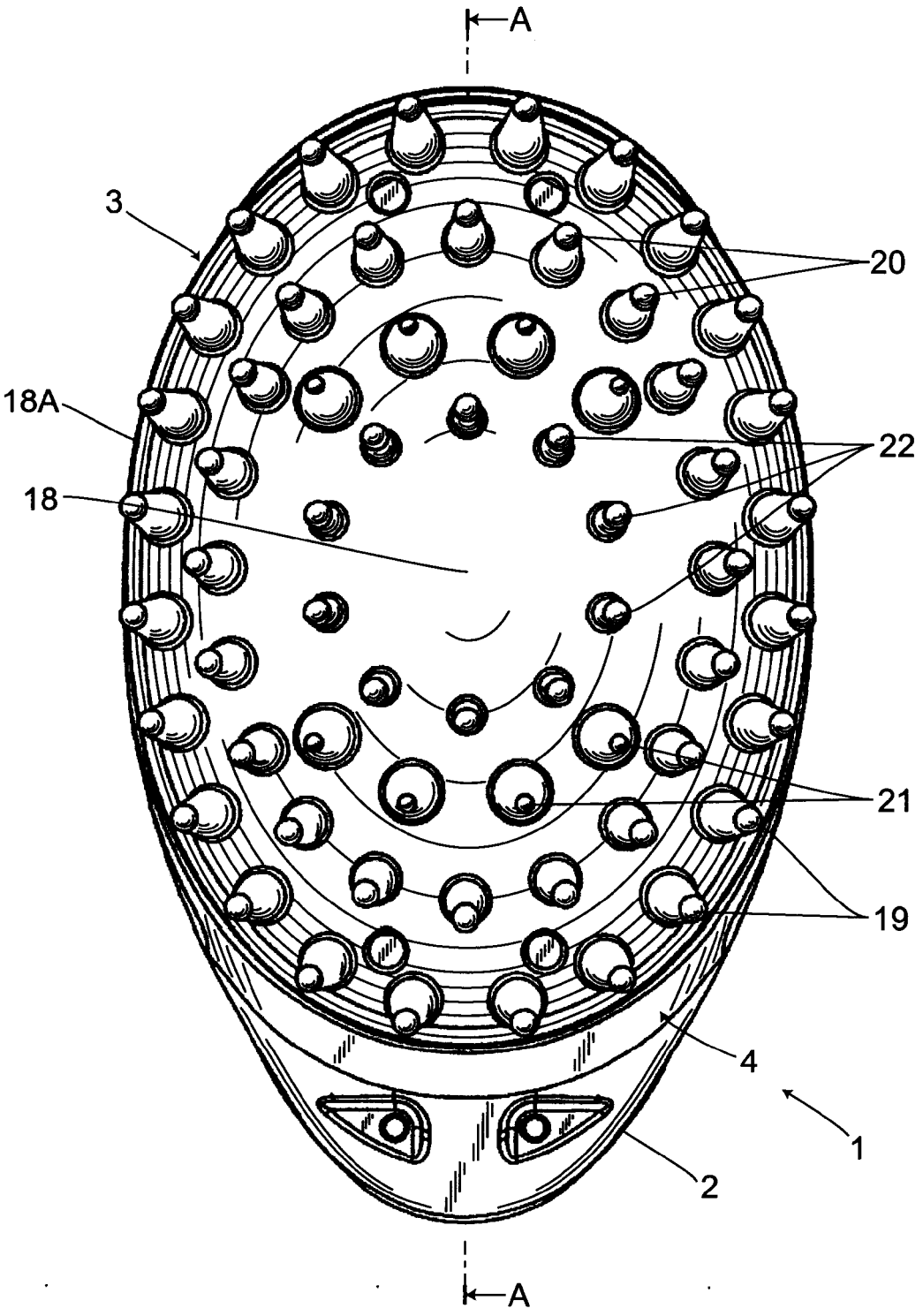


FIG.2

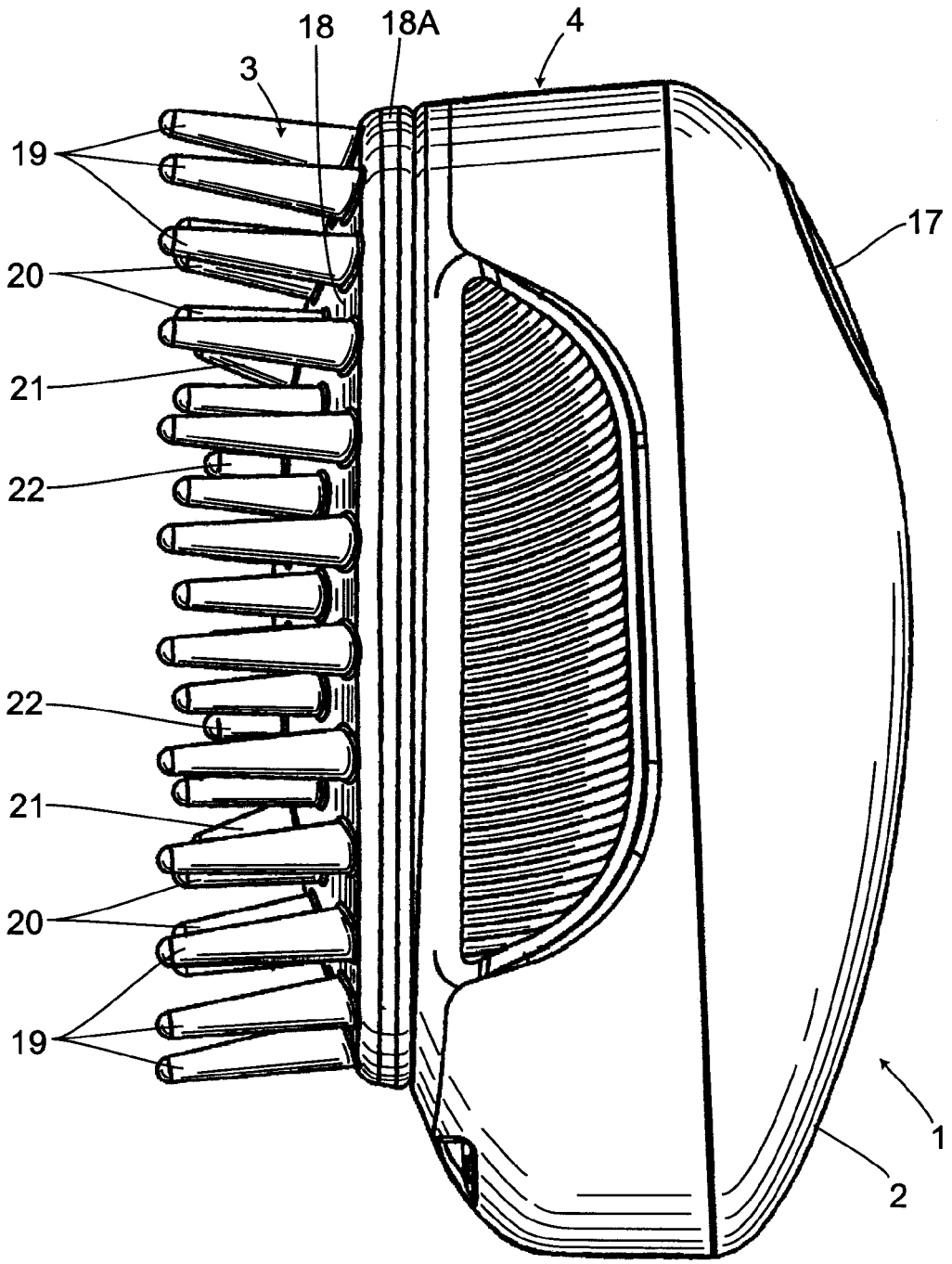


FIG.3

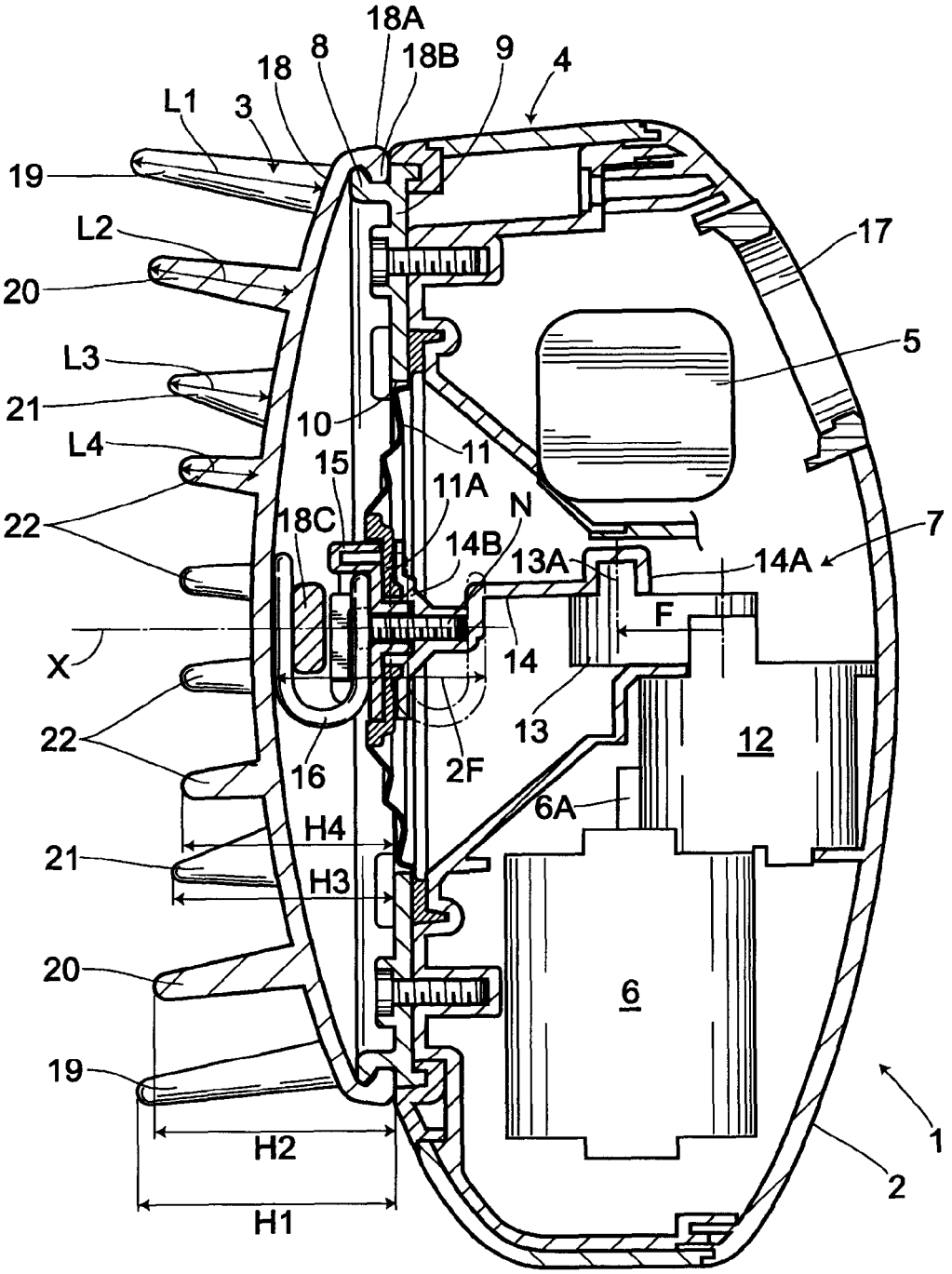

18A
8
18
18B
9
4
L1
3
19
L2
20
17
L3
5
21
10
11
L4
15
11A
N
22
18C
14B
13A
14A
7
F
X
14
22
13
12
16
2F
6A
H4
21
H3
20
6
19
H2
1
2
H1

FIG.4A

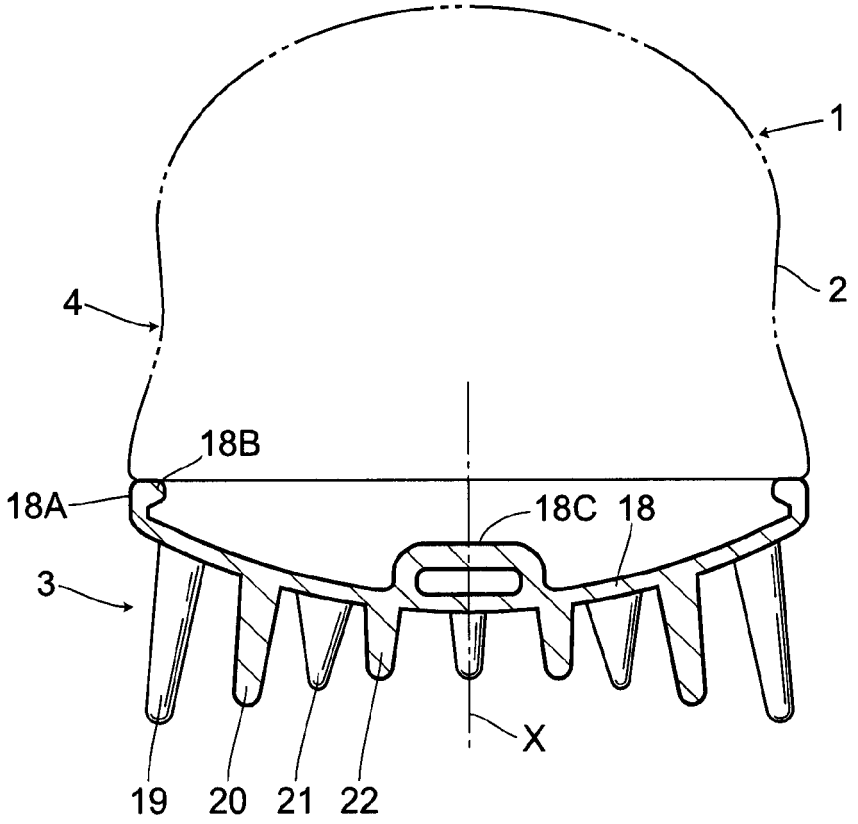


FIG.4B

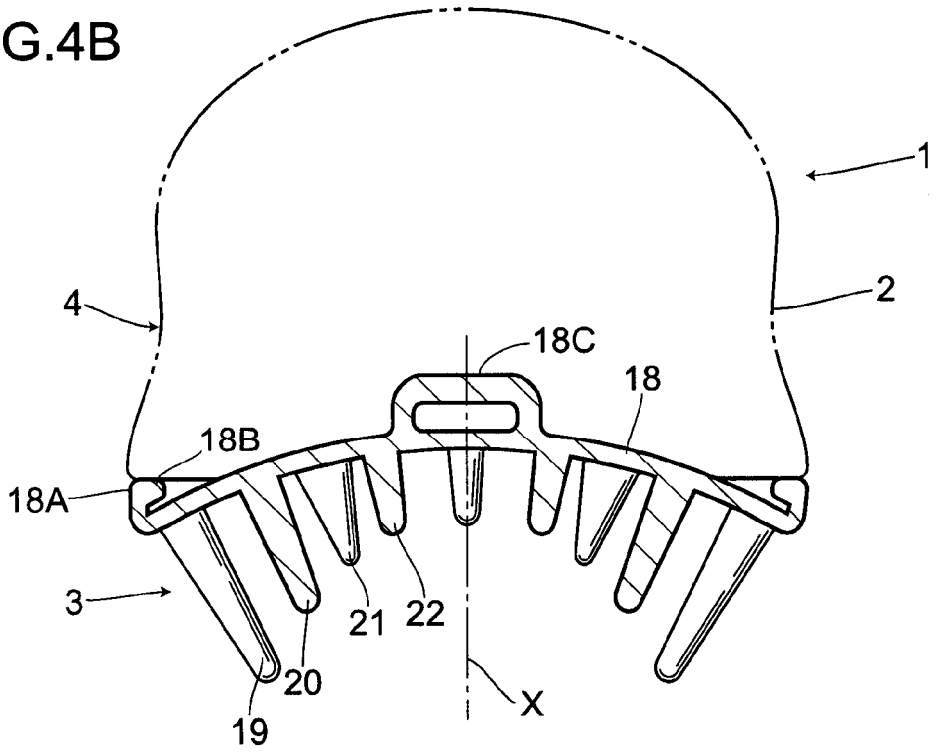


FIG.5A

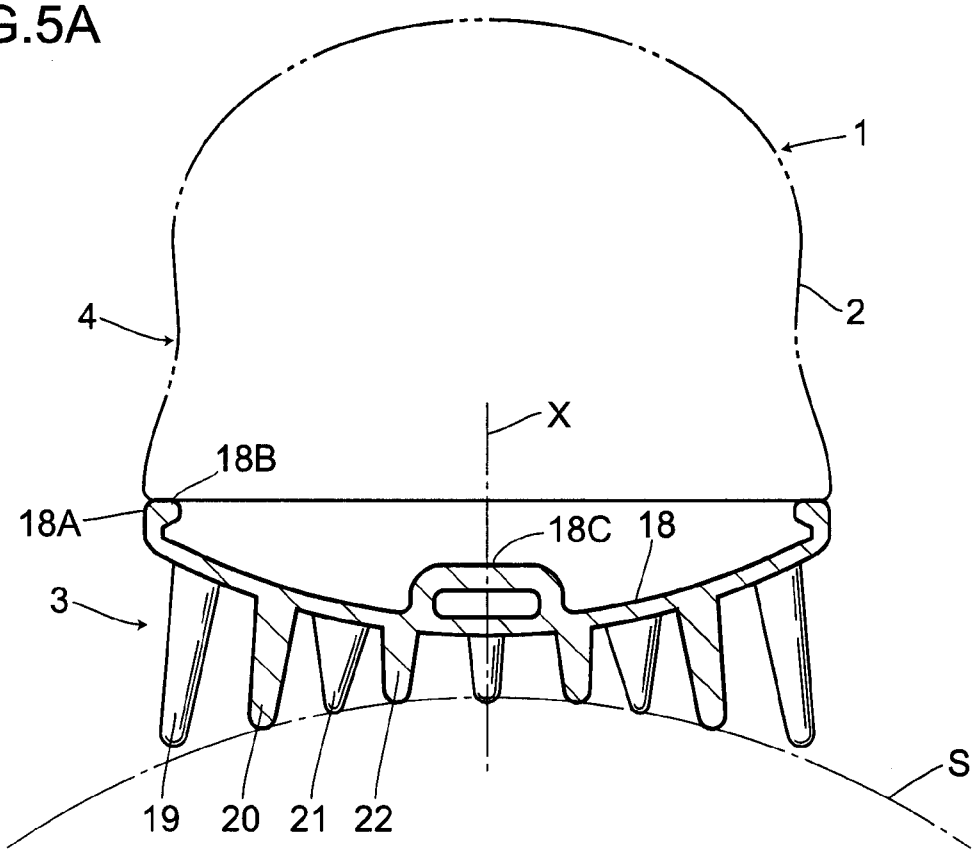
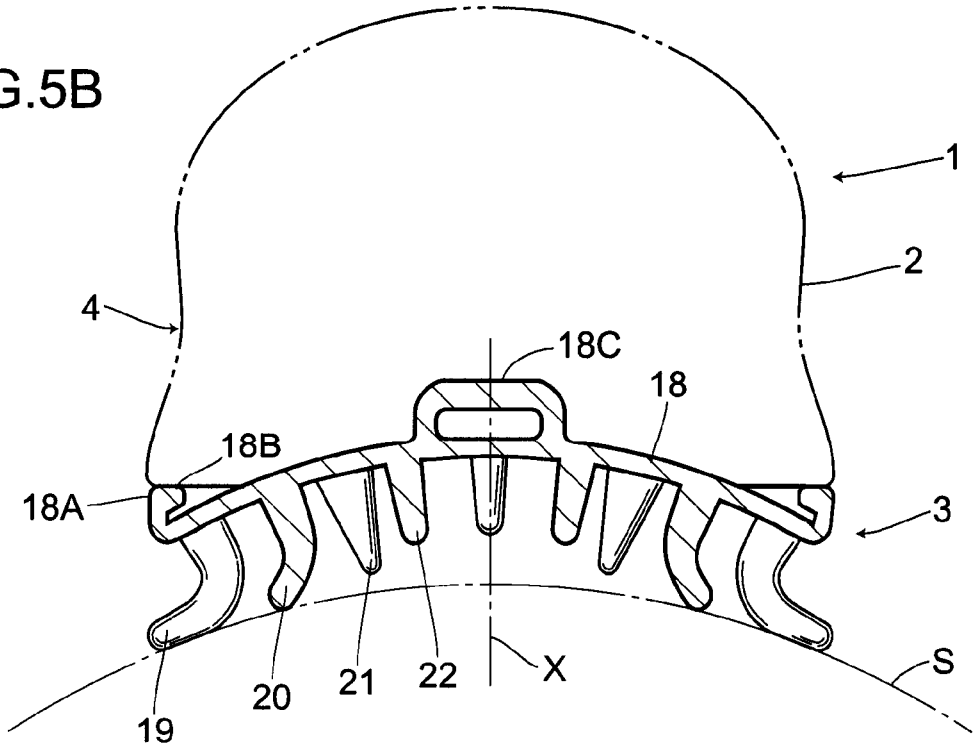

1
2
4
X
18B
18A
18C
18
3
S
19
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21
22

FIG.5B


1
2
4
18C
18
18B
18A
3
S
X
19
20
21
22

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EUROPEAN SEARCH REPORT

Application Number
EP 07 11 0217

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X	JP 2006 141645 A (TSUIN BADO KOGYO KK) 8 June 2006 (2006-06-08) * paragraphs [0015] - [0020]; figures 1-4 * -----	1-6	
A	US 1 713 756 A (HASSLER ROBERT H) 21 May 1929 (1929-05-21) * the whole document * -----	1	

TECHNICAL FIELDS SEARCHED (IPC)

A61H

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	9 June 2008	Schut, Timen

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09-06-2008

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