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(54) **HAIR CURLER AND METHOD FOR USING SAME**

(57) The present application provides a hair curler and a method using for same. The hair curler comprises a main body (1). The main body (1) comprises a first proximal end (2) and a first distal end (3); a first internal space (4) is formed inside the main body (1); a first elongated slot (6) communicated with the first internal space (4) is formed on the first proximal end (2); a first opening (8) of the first elongated slot (6) is formed on the first proximal end (2). The hair curler further comprises a first movable arm (7) movably disposed in the first internal space (4). A heating member for heating hair (33) is disposed on a slot wall of the first elongated slot (6) and/or the first movable arm (7). The hair curler is simple, practicable, safe and convenient.

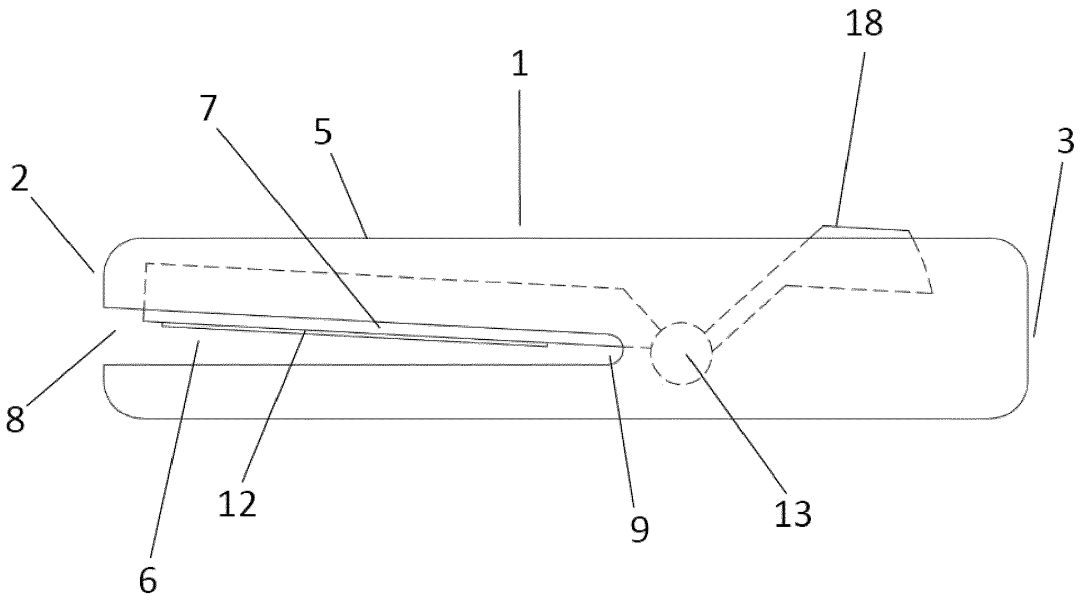

Figure 1

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Description

THCHNICAL FIELD

[0001] The present application relates to the field of hairdressing, and more particularly it relates to a hair curler and a method for using same.

BACKGROUND OF THE INVENTION

[0002] Most of the existing hair curler will have an exposed round rod heating element. In use, the hair is wound on the heating member for heating so that the hair is deformed and shaped in accordance with the shape of the heating member, thereby increasing the curl of the hair. The basic principle of hair curler is: hair is mainly composed of protein, protein structure of the skeleton determines the shape of the hair; proteins have chemical bonds, such as disulfide bonds, hydrogen bonds and salt bonds, etc.; these chemical bonds are used to maintain the structure and shape of the hair. The straight hair is winded on the heating member. The heat of the heating member causes the hair to expand and open the chemical bonds in the protein to make the straight hair in a changeable state. At this point, once the straight hair wrapped around the surface, the straight hair will be curled, and the curled hair is formed; when the curled hair is cooled, the chemical bonds in the hair protein will be rebuilt to keep the hair in a curled state. However, the existing hair curler has the following disadvantages: 1) high temperature will hurt the hair, making the hair lose water; in order to improve the curling efficiency of the curlers, the operating temperature of the existing heating members of the curlers is generally up to 200°C; when the hair touches the heating member for a long time, the hair will be seriously hurt; 2) At the same time, since the heat member is exposed, the user's hand, hair and face may be burned.

TECHNICAL PROBLEM

[0003] The objective of the present invention is to provide a hair curler and a method for using same, aiming at the drawback that the hair will be overheated and be seriously hurt when curled by the present hair curler.

SOLUTION TO THE PROBLEM

Technical solution

[0004] The present application provides a hair curler, the hair curler comprises main body, and the main body comprises a first proximal end and a first distal end; a first internal space is formed inside the main body; a first elongated slot communicated with the first internal space is formed on the first proximal end; a first opening of the first elongated slot is formed on the first proximal end; the hair curler further comprises a first movable arm movably disposed in the first internal space; a heating member for heating hair is disposed on a slot wall of the first elongated slot and/or the first movable arm.

[0005] In the hair curler of the present application, a connecting member is further formed on the main body; the connecting member comprises a movable mechanical structure; the movable mechanical structure is a hinge structure; the first movable arm is connected with the main body through the hinge structure.

[0006] In the hair curler of the present application, a side wall of the main body at the first proximal end is a main body outer wall for cooling the hair; the main body outer wall has a curved surface; when the heating member is working, hair extending into the first elongated slot is heated by the heating member to make hydrogen bond in hair protein opened in the first elongated slot; the hair is cooled down when leaving the first elongated slot, the hydrogen bond is reconstructed; the hair is curled when contacting the main body outer wall.

[0007] In the hair curler of the present application, the heating member comprises a heating surface disposed on the first movable arm and a heating element which is connected on the heating surface and is used for heating the heating surface; when the heating member is working, a temperature of the heating surface is higher than a temperature of the main body outer wall; when the temperature of the heating surface is higher than 180 °C, the temperature of the main body outer wall is at least 90°C lower than the temperature of the heating surface, or the temperature of the main body outer wall is lower than 50% of the temperature of the heating surface.

[0008] In the hair curler of the present application, the heating member comprises a heating body disposed on the slot wall of the first elongated slot; a heat insulation structure is disposed in the main body; the heating body is connected with the main body through the heat insulation structure; when the heating member is working, a temperature of the heating body is higher than the temperature of the main body outer wall; when the temperature of the heating body is higher than 180 °C, the temperature of the main body outer wall is at least 90°C lower than the temperature of heating body, or the temperature of the main body outer wall is lower than 50% of the temperature of heating body.

[0009] In the hair curler of the present application, the first elongated slot extends from the first opening to the first distal end, a bottom is formed at an adjacent first proximal end of the first elongated slot close to the first distal end; the hinge structure is disposed between the bottom and the first distal end; an axis of the hinge structure is perpendicular to an extending direction of the first elongated slot; the first movable arm is pivoted with the axis of the hinge structure and forms a clip with the slot wall of the first elongated slot.

[0010] In the hair curler of the present application, the hinge structure further comprises a button; the button is connected with the axis of the hinge structure through a connecting rod; the minimum distance between the slot

wall of the first elongated slot and the first movable arm is at least 5 mm.

[0011] In the hair curler of the present application, the hair curler further comprises a handle member and a rotatable structure rotatably arranged on the first distal end.

[0012] In the hair curler of the present application, the first elongated slot extends from the first opening to the first distal end; the hair curler further comprises a second movable arm movably disposed in the first internal space; the first movable arm and the second movable arm are fixedly connected with the rotatable structure respectively.

[0013] In the hair curler of the present application, wherein, a gap is formed at the first opening of the first proximal end; the gap extends from the first opening to the first distal end; an extending length of the gap is shorter than an extending length of the first elongated slot.

[0014] In the hair curler of the present application, the first elongated slot extends from the first opening to the first distal end; the heating member for heating the hair is arranged on a first heating arm.

[0015] In the hair curler of the present application, the first heating arm is fixedly connected with the rotatable structure.

[0016] In the hair curler of the present application, the first heating arm extends out of the first internal space.

[0017] In the hair curler of the present application, the hair curler further comprises a second heating arm fixedly connected with the rotatable structure; the second heating arm extends out of the first internal space; when the rotatable structure is rotated, the first heating arm and the second heating arm are rotated relative to the main body

[0018] In the hair curler of the present application, a radial width of the main body narrows from the first proximal end to the first distal end.

[0019] In the hair curler of the present application, a width of the first elongated slot in the circumferential direction of the main body from the first proximal end to the first distal end increases first and then reduces; the first opening and the first heating arm form an annular opening; the first opening forms two proximal corners at the first proximal end.

[0020] In the hair curler of the present application, the first heating arm is cylindrical; the first heating arm extends out of the first internal space; the main body is connected with the rotatable structure; when the rotatable structure is rotated, the main body is rotated relative to the first heating arm.

[0021] In the hair curler of the present application, a radial width of the main body narrows from the first proximal end to the first distal end.

[0022] In the hair curler of the present application, the main body comprises an inner wall; aconvex bone is disposed on the inner wall; the convex bone extends from the first proximal end to the first distal end.

[0023] In the hair curler of the present application, the hair curler further comprises an external sleeve coaxially disposed with the main body and fixedly connected with the handle member; the external sleeve comprises a second proximal end and a second distal end; a second elongated slot is disposed on the external sleeve; a second opening of the second elongated slot is arranged on the second proximal end; the second elongated slot extends from the second proximal end to the second distal end.

[0024] In the hair curler of the present application, a width of the second elongated slot in the circumferential direction of the external sleeve narrows from the second proximal end to the second distal end.

[0025] In the hair curler of the present application, a radial width of the external sleeve narrows from the second proximal end to the second distal end.

[0026] In the hair curler of the present application, the main body is connected with the rotatable structure; when the rotatable structure is rotated, the main body is rotated relatively to the external sleeve.

[0027] In the hair curler of the present application, the hair curler further comprises a motor disposed on the handle member for driving the rotatable structure; the hair curler further comprises a rotating position detecting device disposed on the handle member for detecting a rotating position of the rotatable structure and a control component; the control component is electronically connected with the motor and the rotating position detecting device respectively and is for controlling the rotatable structure to return to an initial position after the hair curler stops working.

[0028] The present application further provides s method for using a hair curler comprising the following steps:

S1) proving a hair curler, the hair curler comprises a main body; a first internal space is formed inside the main body; the main body comprises a first proximal end and a first distal end; a first elongated slot communicated with the first internal space is formed on the first proximal end; the hair curler further comprises a heating member disposed inside the first internal space; a side wall of the main body at the first proximal end is a main body outer wall for cooling the hair;

S2) the hair 33 comprises hair root and hair trip; putting a portion of the hair closing to the hair root into the first elongated slot, then rotating the main body to make the hair wound on the main body outer wall;

S3) then heating the portion of the hair in the first elongated slot by the heating member; moving the main body in the direction of the hair trip; after separating from the first elongated slot, the portion of the hair heated by the heating member contacts with the main body outer wall to be cooled down to form a curled portion; an uncurled portion of the hair continues to be put into the first elongated slot to be heated by the heating member;

S4) repeating step S3 to curl the hair.

THE BENEFICIAL EFFECT OF THE INVENTION

Beneficial effect

[0029] In the present application, by disposing the heating member inside the hair curler and cooling the hair outside the hair curler, it avoids the hair from being serious injury due to overheat. At the same time, the present invention also achieves the purpose of rapidly cooling the heated hair by the outer wall of the main body having a curved surface, thereby improving the efficiency of curling hair. The present application is simple, practicable, safe and convenient.

BRIEF DESCRIPTION OF THE DRAWINGS

Description of drawings

[0030]

Figure 1 is a schematic diagram of a hair curler according to a first embodiment of the present application;
Figure 2 is an internal reference diagram of the hair curler shown in Figure 1;
Figure 3 is a schematic diagram of a hair curler according to a second embodiment of the present application;
Figure 4 is an external reference diagram of the hair curler shown in Figure 3;
Figure 5 is a first use state reference diagram of the hair curler shown in Figure 1;
Figure 6 is a second use state reference diagram of the hair curler shown in Figure 1;
Figure 7 is the schematic diagram of the A-A section shown in figure 6;
Figure 8 is a third use state reference diagram of the hair curler shown in Figure 1;
Figure 9 is a fourth use state reference diagram of the hair curler shown in Figure 1;
Figure 10 is a fifth use state reference diagram of the hair curler shown in Figure 1;
Figure 11 is a sixth use state reference diagram of the hair curler shown in Figure 1;
Figure 12 is a seventh use state reference diagram of the hair curler shown in Figure 1;
Figure 13 is an eighth use state reference diagram of the hair curler shown in Figure 1;
Figure 14 shows the chemical structure of the hair protein;
Figure 15 is a first schematic view of the first part of the hair;
Figure 16 is a second schematic view of the first part of the hair;
Figure 17 is a schematic view of the second part of the hair;
Figure 18 is a schematic view of the third part of the hair;
Figure 19 is a schematic diagram of a hair curler according to a third embodiment of the present application;
Figure 20 is a front view of a hair curler according to a fourth embodiment of the present application;
Figure 21 is a rear schematic view of the hair curler shown in Figure 20;
Figure 22 is a top view of the hair curler shown in Figure 20;
Figure 23 shows the A-A cutaway view as shown in Figure 22;
Figure 24 shows the B-B cutaway view as shown in Figure 22;
Figure 25 is a first use state reference diagram of the hair curler shown in Figure 20;
Figure 26 is a second use state reference diagram of the hair curler shown in Figure 20;
Figure 27 is a schematic diagram of a hair curler according to a fifth embodiment of the present application;
Figure 28 is the schematic diagram of the A-A section of the hair curler shown in figure 27;
Figure 29 is another schematic diagram of the hair curler shown in Figure 27;
Figure 30 is a first use state reference diagram of the hair curler shown in Figure 27;
Figure 31 is a second use state reference diagram of the hair curler shown in Figure 27;
Figure 32 is a schematic diagram of another hair curler according to a fifth embodiment of the present application;
Figure 33 is a schematic diagram of a hair curler according to a sixth embodiment of the present application;
Figure 34 is the schematic diagram of the A-A section of the hair curler shown in figure 33;
Figure 35 is another schematic diagram of the hair curler shown in Figure 33;
Figure 36 is a schematic diagram of another hair curler according to a sixth embodiment of the present application;
Figure 37 is the schematic diagram of the A-A section shown in figure 36;
Figure 38 is a first use state reference diagram of the hair curler shown in Figure 33;
Figure 39 is a second use state reference diagram of the hair curler shown in Figure 33;
Figure 40 is a schematic diagram of a hair curler according to a seventh embodiment of the present application;
Figure 41 is the schematic diagram of the A-A section shown in figure 40;
Figure 42 is a first use state reference diagram of the hair curler shown in Figure 40;
Figure 43 is a second use state reference diagram of the hair curler shown in Figure 40;
Figure 44 is a schematic diagram of another hair curler according to a seventh embodiment of the

present application;

Figure 45 is a schematic diagram of the other hair curler according to a seventh embodiment of the present application.

EMBODIMENT OF THE INVENTION

Embodiments of the present invention

[0031] The technical principle of the invention is: separate the heating member of the hair curler and the forming part for cooling to avoid the hair from being overheated to be hurt.

[0032] The present application has been described in detail by the following two embodiments.

The first embodiment

[0033] Referring to Figure 1, Figure 1 shows the hair curler of the first embodiment of the present application. The hair curler comprises a main body 1. The main body 1 is a main part for being wound by hair and curling the hair. Preferably, in the present embodiment, the main body 1 is in a shape of a round rod. Of course, the main body 1 can also be in a shape of a dumbbell etc.

[0034] Further, referring to Figure 1 and Figure 2, a first internal space 4 is formed inside the main body 1. The main body 1 comprises a first proximal end 2 and a first distal end 3. In the present embodiment, the two ends of the main body 1 are the first proximal end 2 and the first distal end 3 respectively.

[0035] A first elongated slot 6 communicated with the first internal space 4 is formed on the first proximal end 2. Referring to Figure 1 and Figure 2, in the present embodiment, a first opening 8 of the first elongated slot 6 is formed on the first proximal end 2. In this way, the hair 33 can be easily put into the first elongated slot 6. Of course, the first opening 8 of the first elongated slot 6 can be formed on the side wall of the main body 1.

[0036] Further, referring to Figure 1 and Figure 2, the hair curler further comprises a first movable arm 7 movably disposed in the first internal space 4. A heating member for heating hair 33 is disposed on a slot wall of the first elongated slot 6 and/or the first movable arm 7.

[0037] Specifically, referring to Figure 1, a connecting member is further formed on the main body 1. The connecting member comprises a movable mechanical structure, and the movable mechanical structure is a hinge structure 13. The first movable arm 7 is connected with the main body 1 through the hinge structure 13. In the present embodiment, the connecting member is disposed in the first internal space 4.

[0038] Specifically, in the present embodiment, referring to Figure 1, the first elongated slot 6 extends from the first opening 8 to the first distal end 3, a bottom 9 is formed at an adjacent first proximal end of the first elongated slot 6 close to the first distal end 3; the hinge structure 13 is disposed between the bottom 9 and the first distal end 3; an axis of the hinge structure 13 is perpendicular to an extending direction of the first elongated slot 6; the first movable arm 7 is pivoted with the axis of the hinge structure 13 and forms a clip with the slot wall of the first elongated slot 6. The clip is for holding the hair 33.

[0039] Further, in the present embodiment, the heating member comprises a heating surface 12 disposed on the first movable arm 7 and a heating element 28 which is connected on the heating surface 12 and is used for heating the heating surface 12. A side wall of the main body 1 at the first proximal end 2 is a main body outer wall 5 for cooling the hair 33.

[0040] When the heated hair 33 is cooled down by the main body outer wall 5, the shape of the cooled hair 33 is fixed. In general, when the heating member is working, the temperature of the heating surface 12 is higher than the temperature of the main body outer wall 5; when the temperature of the heating surface 12 is higher than 180°C, the temperature of the main body outer wall 5 is at least 90°C lower than the temperature of the heating surface 12, or the temperature of the main body outer wall 5 is lower than 50% of the temperature of the heating surface 12. Thus, to make the hair 33 curled, the main body outer wall 5 has a curved surface 27, as shown in Figure 7.

[0041] Further, in the present embodiment, referring to Figure 1, to prevent the first movable arm 7 and the slot wall of the first elongated slot 6 from holding the hair 33 for a long time, which will cause the hair 33 to be overheated to be burned, the minimum distance between the slot wall of the first elongated slot 6 and the first movable arm 7 is at least 0.5mm. Here, in general, an angle is formed between the slot wall of the first elongated slot 6 and the first movable arm 7, as shown in Figure 5. When the slot wall of the first elongated slot 6 and the first movable arm 7 close to each other, the minimum distance between the first elongated slot 6 and the first movable arm 7 is formed, as shown in Figure 6. In this way, the hair 33 will be not over clamped.

[0042] Further, referring to Figure 1 and Figure 2, the hinge structure 13 further comprises a button 18. The button 18 is connected with the axis of the hinge structure through a connecting rod 181. Specifically, in the present embodiment, the hinge structure 13 comprises a button 18. A second internal space is also formed inside the main body 1. A through hole communicated with the second internal space is formed on the bottom 9. The button 18 is connected with the axis of the hinge structure 13 by the connecting rod 181 going through the through hole. Meanwhile, a button hole 182 which is communicated with the second internal space and is used for the button 18 extending is formed on the main body 1. In this way, the axis of the hinge structure 13 can be turned by pressing the button 18 so as to turn the first movable arm 7 which is connected with the hinge structure 13.

[0043] In order to facilitate the button 18 to reset, in the present embodiment, a basal body 191 is formed in the second internal space in the main body 1. The hinge

structure 13 further comprises an elastic structure 19. One end of the elastic structure 19 is fixed on the basal body 191, and the other end of the elastic structure 19 is fixed on the button 18. In this way, when pressing the button 18, the elastic structure 19 is compressed; when the button 18 is released, the elastic structure 19 holds the button 18 so that the button 18 is reset. The elastic structure 19 comprises a spring.

[0044] The method of using the hair curler of the present embodiment is shown in Figure 8 to Figure 11. The hair 33 comprises hair root 22 and hair trip 23. When using it, the portion of the hair 33 closing to the hair root 22 is put into the first elongated slot 6 to contact the heating surface 12, as shown in Figure 8. Then the main body 1 is rotated to make the hair 33 wound on the main body outer wall 5, as shown in Figure 9. Next, the hair 33 contacting the heating surface 12 is heated by the heating surface 12, and the main body 1 is moved in the direction of the hair trip 23, as shown in Figure 9 to Figure 11. In this way, after separating from the first elongated slot 6, the portion of the hair 33 heated by the heating member contacts with the main body outer wall 5 to be cooled down to form a curled portion 24; an uncurled portion 25 of the hair 33 continues to be put into the first elongated slot 6 to contact the heating surface 12. The above steps are repeated to make the hair curled, as shown in Figure 12.

[0045] The principle of the above-mentioned use method is shown in Figure 13-Figure 18. Before the hair 33 is heated, the structure of the hair 33 is shown in Figure 14 and Figure 15. Amino acids in proteins are linked by the hydrogen bond 32. When the hair 33 is put into the first elongated slot 6 and is heated by the heating surface 12, in the first part 29 of the hair 33, the hydrogen bond 32 in the protein is opened, as shown in Figure 16. When the second part 30 of the hair 33 which leaves the first elongated slot 6 contacts the main body outer wall 5, the second part 30 is curled, as shown in Figure 17. The hydrogen bond of the protein in the third part 31 of the hair 33 which leans to the main body outer wall 5 and has been cooled is reconstructed, thus making the shape of the third part 31 fixed, as shown in Figure 18.

The second embodiment

[0046] Compared with the first embodiment, the difference of the second embodiment is: in the present embodiment, the heating member does not comprise the heating surface 12, but comprises a heating body 14 disposed on the slot wall of the first elongated slot 6. The specific scheme is as follows:

[0047] Referring to Figure 3, Figure 3 shows the hair curler of the second embodiment of the present application. The hair curler comprises a main body 1. The main body 1 is a main part for being wound by hair and curling the hair. Preferably, in the present embodiment, the main body 1 is in a shape of a round rod. Of course, the main body 1 can also be in a shape of a dumbbell etc.

[0048] Further, referring to Figure 3 and Figure 4, a first internal space 4 is formed inside the main body 1. The main body 1 comprises a first proximal end 2 and a first distal end 3. In the present embodiment, the two ends of the main body 1 are the first proximal end 2 and the first distal end 3 respectively.

[0049] A first elongated slot 6 communicated with the first internal space 4 is formed on the first proximal end 2. Referring to Figure 3 and Figure 4, in the present embodiment, a first opening 8 of the first elongated slot 6 is formed on the first proximal end 2. In this way, the hair 33 can be easily put into the first elongated slot 6. Of course, the first opening 8 of the first elongated slot 6 can be formed on the side wall of the main body 1.

[0050] Further, referring to Figure 3 and Figure 4, the hair curler further comprises a first movable arm 7 movably disposed in the first internal space 4. A heating member for heating hair 33 is disposed on a slot wall of the first elongated slot 6 and/or the first movable arm 7.

[0051] Specifically, referring to Figure 3, a connecting member is further formed on the main body 1. The connecting member comprises a movable mechanical structure, and the movable mechanical structure is a hinge structure 13. The first movable arm 7 is connected with the main body 1 through the hinge structure 13. In the present embodiment, the connecting member is disposed in the first internal space 4.

[0052] Specifically, in the present embodiment, referring to Figure 1, the first elongated slot 6 extends from the first opening 8 to the first distal end 3, a bottom 9 is formed at an adjacent first proximal end of the first elongated slot 6 close to the first distal end 3; the hinge structure 13 is disposed between the bottom 9 and the first distal end 3; an axis of the hinge structure 13 is perpendicular to an extending direction of the first elongated slot 6; the first movable arm 7 is pivoted with the axis of the hinge structure 13 and forms a clip with the slot wall of the first elongated slot 6. The clip is for holding the hair 33.

[0053] Further, in the present embodiment, the heating member comprises a heating body 14 disposed on the slot wall of the first elongated slot 6 and a heating element 28 which is connected on the heating body 14 and is used for heating the heating body 14. A heat insulation structure 15 is also disposed inside the main body 1. The heating body 14 is connected with the main body 1 through the heat insulation structure 15. A side wall of the main body 1 at the first proximal end 2 is a main body outer wall 5 for cooling the hair 33.

[0054] When the heated hair 33 is cooled down by the main body outer wall 5, the shape of the cooled hair 33 is fixed. In general, when the heating member is working, the temperature of the heating surface 12 is higher than the temperature of the main body outer wall 5; when the temperature of the heating surface 12 is higher than 180°C, the temperature of the main body outer wall 5 is at least 90°C lower than the temperature of the heating surface 12, or the temperature of the main body outer wall 5 is lower than 50% of the temperature of the heating

surface 12. Thus, to make the hair 33 curled, the main body outer wall 5 has a curved surface 27, as shown in Figure 7.

[0055] Further, in the present embodiment, referring to Figure 3, to prevent the first movable arm 7 and the slot wall of the first elongated slot 6 from holding the hair 33 for a long time, which will cause the hair 33 to be overheated to be burned, the minimum distance between the slot wall of the first elongated slot 6 and the first movable arm 7 is at least 0.5mm. Here, in general, an angle is formed between the slot wall of the first elongated slot 6 and the first movable arm 7, as shown in Figure 5. When the slot wall of the first elongated slot 6 and the first movable arm 7 close to each other, the minimum distance between the first elongated slot 6 and the first movable arm 7 is formed, as shown in Figure 6. In this way, the hair 33 will be not over clamped.

[0056] Further, referring to Figure 3 and Figure 4, the hinge structure 13 further comprises a button 18. The button 18 is connected with the axis of the hinge structure through a connecting rod 181. Specifically, in the present embodiment, the hinge structure 13 comprises a button 18. A second internal space is also formed inside the main body 1. A through hole communicated with the second internal space is formed on the bottom 9. The button 18 is connected with the axis of the hinge structure 13 by the connecting rod 181 going through the through hole. Meanwhile, a button hole 182 which is communicated with the second internal space and is used for the button 18 extending is formed on the main body 1. In this way, the axis of the hinge structure 13 can be turned by pressing the button 18 so as to turn the first movable arm 7 which is connected with the hinge structure 13.

[0057] In order to facilitate the button 18 to reset, in the present embodiment, a basal body 191 is formed in the second internal space in the main body 1. The hinge structure 13 further comprises an elastic structure 19. One end of the elastic structure 19 is fixed on the basal body 191, and the other end of the elastic structure 19 is fixed on the button 18. In this way, when pressing the button 18, the elastic structure 19 is compressed; when the button 18 is released, the elastic structure 19 holds the button 18 so that the button 18 is reset. The elastic structure 19 comprises a spring.

The third embodiment

[0058] Compared with the first embodiment, the difference of the third embodiment is: the hair curler further comprises a second movable arm 10 movably disposed the first internal space 4.The specific scheme is as follows:

[0059] Referring to Figure 19, Figure 19 shows the hair curler of the third embodiment of the present application. The hair curler comprises a main body 1. The main body 1 is a main part for being wound by hair and curling the hair. Preferably, in the present embodiment, the main body 1 is in a shape of a round rod. Of course, the main body 1 can also be in a shape of a dumbbell etc.

[0060] Further, referring to Figure 19, a first internal space 4 is formed inside the main body 1. The main body 1 comprises a first proximal end 2 and a first distal end 3. In the present embodiment, the two ends of the main body 1 are the first proximal end 2 and the first distal end 3 respectively.

[0061] A first elongated slot 6 communicated with the first internal space 4 is formed on the first proximal end 2. Referring to Figure 19, in the present embodiment, a first opening 8 of the first elongated slot 6 is formed on the first proximal end 2. In this way, the hair 33 can be easily put into the first elongated slot 6. Of course, the first opening 8 of the first elongated slot 6 can be formed on the side wall of the main body 1.

[0062] Further, referring to Figure 19, the hair curler further comprises a first movable arm 7 and a second movable arm 10 movably disposed in first internal space. A heating member for heating hair 33 is disposed on a slot wall of the first elongated slot 6 and/or the first movable arm 7.

[0063] Specifically, referring to Figure 19, a connecting member is further formed on the main body 1. The connecting member comprises a movable mechanical structure, and the movable mechanical structure is a hinge structure 13. The first movable arm 7 is connected with the main body 1 through the hinge structure 13. In the present embodiment, the connecting member is disposed in the first internal space 4.

[0064] Specifically, in the present embodiment, referring to Figure 19, the first elongated slot 6 extends from the first opening 8 to the first distal end 3, a bottom 9 is formed at an adjacent first proximal end of the first elongated slot 6 close to the first distal end 3; the hinge structure 13 is disposed between the bottom 9 and the first distal end 3; an axis of the hinge structure 13 is perpendicular to an extending direction of the first elongated slot 6; the first movable arm 7 and the second movable arm 10 are pivoted with the axis of the hinge structure 13 respectively. A clip is formed between the first movable arm 7 and the second movable arm 10. The clip is for holding the hair 33.

[0065] Further, in the present embodiment, the heating member comprises two heating surfaces 12 respectively disposed on the first movable arm 7 and the second movable arm 10 and a heating element 28 which is connected with the two heating surfaces 12 and is used for heating the two heating surfaces 12. A side wall of the main body 1 at the first proximal end 2 is a main body outer wall 5 for cooling the hair 33.

[0066] When the heated hair 33 is cooled down by the main body outer wall 5, the shape of the cooled hair 33 is fixed. In general, when the heating member is working, the temperature of the heating body 14 is higher than the temperature of the main body outer wall 5; when the temperature of the heating body 14 is higher than 180°C, the temperature of the main body outer wall 5 is at least 90°C lower than the temperature of the heating body 14, or the

temperature of the main body outer wall 5 is lower than 50% of the temperature of the heating body 14. Thus, to make the hair 33 curled, the main body outer wall 5 has a curved surface 27, as shown in Figure 7.

[0067] Further, in the present embodiment, referring to Figure 19, to prevent the first movable arm 7 and the second movable arm 10 from holding the hair 33 for a long time, which will cause the hair 33 to be overheated to be burned, the minimum distance between the second movable arm 10 and the first movable arm 7 is at least 0.5mm. Here, in general, an angle is formed between the second movable arm 10 and the first movable arm 7, as shown in Figure 19. When the second movable arm 10 and the first movable arm 7 close to each other, the minimum distance between the second movable arm 10 and the first movable arm 7 is formed. In this way, the hair 33 will be not over clamped.

[0068] Further, referring to Figure 19, the hinge structure 13 comprises a first button 18a and a second button 18b. A second internal space is formed inside the main body 1. A through hole communicated with the second internal space is formed on the bottom 9. The first button 18a is connected with the second movable arm 10 through the first connecting rod 181a to form a first scissor arm which is rotatable with the axis of the hinge structure 13. The second button 18b is connected with the first movable arm 7 through the second connecting rod 181b to form a second scissor arm which is rotatable with the axis of the hinge structure 13. Meanwhile, a first button hole 182a which is communicated with the second internal space and is used for the first button 18a extending and a second button hole 182b which is communicated with the second internal space and is used for the second button 18b extending are formed on the main body 1. In this way, by pressing the first button 18a and the second button 18b at the same time, the first movable arm 7 and the second movable arm 10 can be close to each other.

[0069] In order to facilitate the first button 18a and the second button 18b to reset, in the present embodiment, a first basal body 191a and a second basal body 191b are formed in the main body 1. The hinge structure 13 further comprises a first elastic structure 19a and a second elastic structure 19b. One end of the first elastic structure 19a is fixed on the first basal body 191 a, and the other end of the first elastic structure 19a is fixed on the first button 18a. One end of the second elastic structure 19b is fixed on the second basal body 191b, and the other end of the second elastic structure 19b is fixed on the second button 18b. In this way, when pressing the first button 18a, the first elastic structure 19a is compressed; when the first button 18a is released, the first elastic structure 19a holds the first button 18a so that the first button 18a is reset. Similarly, when pressing the second button 18b, the second elastic structure 19b is compressed; when the second button 18b is released, the second elastic structure 19b holds the second button 18b so that the second button 18b is reset. Here, the first elastic structure 19a and/or the second elastic structure 19b comprise a spring.

[0070] Further, in the present embodiment, the hair curler further comprises a handle member 20. A rotatable structure 21 is disposed on the first distal end 3, and the rotatable structure 21 is rotatably mounted on the handle member 20.

[0071] Specifically, in the present embodiment, a ring-shaped limiting slot 201 is formed on the side wall of the handle member 20. A limiting hole 301 communicated with the second internal space is formed on the first distal end 3. In this way, a ring-shaped rotatable structure 21 is formed on the first distal end 3. The rotatable structure 21 is rotatably mounted in the limiting slot 201 to make the main body 1 rotate relative to the handle member 20.

The fourth embodiment

[0072] Compared with the third embodiment, the difference of the fourth embodiment is: the hair curler of the fourth embodiment does not comprise a connecting member, and the first movable arm 7 and second movable arm 10 are fixedly connected with the rotatable structure 21 respectively.

[0073] Specifically, as shown in Figure 20-Figure 24, Figure 20 is a front view of a hair curler according to a fourth embodiment of the present application; Figure 21 is a rear schematic view of the hair curler shown in Figure 20; Figure 22 is a top view of the hair curler shown in Figure 20; Figure 23 shows the A-A cutaway view as shown in Figure 22; Figure 24 shows the B-B cutaway view as shown in Figure 22.

[0074] In Figure 20-Figure 21, the hair curler comprises a main body 1 for curling the hair 33. The main body 1 comprises a first proximal end 2 and a first distal end 3; a first internal space 4 is formed inside the main body 1; a first elongated slot 6 communicated with the first internal space 4 is formed on the first proximal end 2; a first opening 8 of the first elongated slot 6 is formed on the first proximal end 2; the first elongated slot 6 extends from the first opening 8 to the first distal end 3; the hair curler further comprises a first movable arm 7 and a second movable arm 10 movably disposed in the first internal space 4; a heating member for heating the hair 33 is disposed on the first movable arm 7and/or the second movable arm 10.

[0075] As shown in Figure 22-Figure 24, the first movable arm 7 and the second movable arm 10 are fixedly connected with the rotatable structure 21 respectively. A gap 56 is formed at the first opening 8 of the first proximal end 2, and the gap 56 extends from the first opening 8 to the first distal end 3 and extends to the gap bottom 59; an extending length of the gap 56 is shorter than an extending length of the first elongated slot 6.

[0076] As shown in Figure 23-Figure 24, the hair curler further comprises a handle member 20 and a rotatable structure 21 which is rotatably disposed on the first distal end 3 and is connected with the handle member 20. Since the extending length of the gap 56 and the extending

length of the first elongated slot 6 are different, thus the hair will not be overlapped when rotating.

[0077] When using, the hair 33 is put in the gap 56 and the first elongated slot 6, and the hair 33 is put between the first movable arm 7 and the second movable arm 10, as shown in Figure 25; then the first movable arm 7 and the second movable arm 10 are made to rotate relative to the main body 1 and the first elongated slot 6, so as to make the hair 33 wound on the first movable arm 7 and the second movable arm 10, and the hair is heated by the heating element 28, as shown in Figure 26.

The fifth embodiment

[0078] Compared with the fourth embodiment, the difference of the fifth embodiment is: the first movable arm 7 and the second movable arm 10 are replaced by the first heating arm 77 and the second heating arm 710 respectively.

[0079] As shown in Figure 27-Figure 29, Figure 27 is a schematic diagram of a hair curler according to a fifth embodiment of the present application; Figure 28 is the schematic diagram of the A-A section of the hair curler shown in figure 27; Figure 29 is another schematic diagram of the hair curler shown in Figure 27.

[0080] Specifically, in Figure 27-29, a first internal space 4 is formed inside the main body 1; a first elongated slot 6 communicated with the first internal space 4 is formed on the first proximal end 2; a first opening 8 of the first elongated slot 6 is formed on the first proximal end 2; the first elongated slot 6 extends from the first opening 8 to the first distal end 3; the hair curler further comprises a first heating arm 77 fixedly connected with the rotatable structure 21. A heating member for heating the hair 33 is disposed on the first heating arm 77.

[0081] In the present embodiment, the first heating arm 77 is cylindrical, and the first heating arm 77 extends out of the first internal space 4. The radial width of the main body 1 narrows from the first proximal end 2 to the first distal end 3.

[0082] When the hair curler is working, the hair 33 will extend into the first internal space 4 through the first opening 8, and is moved along the extending direction of the first elongated slot 6, thus it is attached to the first heating arm 77 to be heated, as shown in Figure 30 and 31.

[0083] Further and preferably, as shown in Figure 32, Figure 32 is a schematic diagram of another hair curler according to a fifth embodiment of the present application.

[0084] In Figure 32, the hair curler further comprises a second heating arm 710 connected with the rotatable structure 21; the second heating arm 710 extends out of the first internal space 4. By the rotation of the rotatable structure 21, the first heating arm 77 and the second heating arm 710 are rotated relative to the main body 1. In this way, the hair 33 putting into the first elongated slot 6 and the first internal space 4 is wound on first heating arm 77 and the second heating arm 710, so as to obtain better heating.

The sixth embodiment

[0085] Compared with the fifth embodiment, the difference of the sixth embodiment is: the first heating arm 77 is fixed, and the main body 1 is rotatable; meanwhile, the shape of the first elongated slot 6 is different.

[0086] As shown in Figure 33- Figure 35, Figure 33 is a schematic diagram of a hair curler according to a sixth embodiment of the present application; Figure 34 is the schematic diagram of the A-A section of the hair curler shown in figure 33; Figure 35 is another schematic diagram of the hair curler shown in Figure 33.

[0087] Specifically, as shown in Figure 33-Figure 35, a width of the first elongated slot 6 in the circumferential direction of the main body 1 from the first proximal end 2 to the first distal end 3 increases first and then reduces. The first opening 8 and the first heating arm 77 form an annular opening; the first opening 8 forms two proximal corners at the first proximal end 2.

[0088] When the hair curler is working, the hair 33 will extend into the first internal space 4 through the first opening 8. Then the main body 1 and the first elongated slot 6 rotate relative to the first heating arm 77, and the hair 33 is moved along the extending direction of the first elongated slot 6, thus it is attached to the first heating arm 77 to be heated, as shown in Figure 38 and 39.

[0089] Preferably, as shown in Figure 36-37, the main body 1comprises an inner wall 97, and a convex bone 99 is disposed on the inner wall. The convex bone 99 extends from the first proximal end 2 to the first distal end 3. In the present embodiment, there are a plurality of convex bones 99.

[0090] Through the plurality of convex bones 99, the hair 33 put into the first elongated slot 6 can be limited, so as to be better heated.

The seventh embodiment

[0091] Compared with the sixth embodiment, the difference of the seventh embodiment is: the hair curler further comprises an external sleeve 51 coaxially disposed with the main body 1 and fixedly connected with the handle member 20.

[0092] Specifically, as shown in Figure 40-41, Figure 40 is a schematic diagram of a hair curler according to a seventh embodiment of the present application; Figure 41 is the schematic diagram of the A-A section shown in figure 40.

[0093] The external sleeve 51 comprises a second proximal end 52 and a second distal end 53; a second elongated slot 54 is disposed on the external sleeve 51; a second opening 58 of the second elongated slot 54 is arranged on the second proximal end 52; the second elongated slot 54 extends from the second proximal end 52 to the second distal end 53.

[0094] Preferably, a width of the second elongated slot 54 in the circumferential direction of the external sleeve 51 narrows from the second proximal end 52 to the second distal end 53.

[0095] When working, the hair 33 is put into the second elongated slot 54 and the first elongated slot 6. By the rotation of the rotatable structure 21, the main body 1 and the first elongated slot 6 rotate relative to the external sleeve 51 and the second elongated slot 54, as shown in Figure 42-43; in this way, the hair 33 is wound on the first heating arm 77, so as to be heated.

[0096] Further, the hair curler further comprises a motor (not shown) disposed on the handle member 20 for driving the rotatable structure 21; the hair curler further comprises a rotating position detecting device (not shown) disposed on the handle member 20 for detecting a rotating position of the rotatable structure 21 and a control component (not shown); the control component is electronically connected with the motor and the rotating position detecting device respectively and is for controlling the rotatable structure 21 to return to an initial position after the hair curler stops working.

[0097] The axis of the main body 1 can coincide with the axial of the handle member 20, as shown in Figure 44, and may not coincide with the axis of the handle member 20, as shown in Figure 45.

[0098] In addition, the present application further provides s method for using a hair curler comprising the following steps:

S1) proving a hair curler, the hair curler comprises a main body 1; a first internal space 4 is formed inside the main body 1; the main body 1 comprises a first proximal end 2 and a first distal end 3; a first elongated slot 6 communicated with the first internal space 4 is formed on the first proximal end 2; the hair curler further comprises a heating member disposed inside the first internal space 4; a side wall of the main body 1 at the first proximal end 2 is a main body outer wall 5 for cooling the hair 33;

S2) the hair 33 comprises hair root 22 and hair trip 23; putting a portion of the hair 33 closing to the hair root 22 into the first elongated slot 6, then rotating the main body 1 to make the hair 33 wound on the main body outer wall 5;

S3) then heating the portion of the hair 33 in the first elongated slot 6 by the heating member; moving the main body 1 in the direction of the hair trip 23; after separating from the first elongated slot 6, the portion of the hair 33 heated by the heating member contacts with the main body outer wall 5 to be cooled down to form a curled portion 24; an uncurled portion 25 of the hair 33 continues to be put into the first elongated slot 6 to be heated by the heating member;

S4) repeating step S3 to curl the hair 33.

Industrial applicability

[0099] In the present application, by disposing the heating member inside the hair curler and cooling the hair outside the hair curler, it avoids the hair from being serious injury due to overheat. At the same time, the present invention also achieves the purpose of rapidly cooling the heated hair by the outer wall of the main body having a curved surface, thereby improving the efficiency of curling hair. The present application is simple, practicable, safe and convenient.

Claims

1. A hair curler, wherein, the hair curler comprises main body (1), and the main body (1) comprises a first proximal end (2) and a first distal end (3); a first internal space (4) is formed inside the main body (1); a first elongated slot (6) communicated with the first internal space (4) is formed on the first proximal end (2); a first opening (8) of the first elongated slot (6) is formed on the first proximal end (2); the hair curler further comprises a first movable arm (7) movably disposed in the first internal space (4); a heating member for heating hair (33) is disposed on a slot wall of the first elongated slot (6) and/or the first movable arm (7).

2. The hair curler according to claim 1, wherein, a connecting member is further formed on the main body (1); the connecting member comprises a movable mechanical structure; the movable mechanical structure is a hinge structure (13); the first movable arm (7) is connected with the main body (1) through the hinge structure (13).

3. The hair curler according to claim 2, wherein, a side wall of the main body (1) at the first proximal end (2) is a main body outer wall (5) for cooling the hair (33); the main body outer wall (5) has a curved surface (27); when the heating member is working, hair (33) extending into the first elongated slot (6) is heated by the heating member to make hydrogen bond in hair (33) protein opened in the first elongated slot; the hair (33) is cooled down when leaving the first elongated slot (6), the hydrogen bond is reconstructed; the hair (33) is curled when contacting the main body outer wall (5).

4. The hair curler according to claim 3, wherein, the heating member comprises a heating surface (12) disposed on the first movable arm (7) and a heating element (28) which is connected on the heating surface (12) and is used for heating the heating surface (12); when the heating member is working, a temperature of the heating surface (12) is higher than a temperature of the main body outer wall (5); when

the temperature of the heating surface (12) is higher than 180°C, the temperature of the main body outer wall (5) is at least 90°C lower than the temperature of the heating surface (12), or the temperature of the main body outer wall (5) is lower than 50% of the temperature of the heating surface (12).

5. The hair curler according to claim 4, wherein, the heating member comprises a heating body (14) disposed on the slot wall of the first elongated slot (6); a heat insulation structure (15) is disposed in the main body (1); the heating body (14) is connected with the main body (1) through the heat insulation structure (15); when the heating member is working, a temperature of the heating body (14) is higher than the temperature of the main body outer wall (5); when the temperature of the heating body (14) is higher than 180°C, the temperature of the main body outer wall (5) is at least 90°C lower than the temperature of heating body (14), or the temperature of the main body outer wall (5) is lower than 50% of the temperature of heating body (14).

6. The hair curler according to claim 2, wherein, the first elongated slot (6) extends from the first opening (8) to the first distal end (3), a bottom (9) is formed at an adjacent first proximal end of the first elongated slot (6) close to the first distal end (3); the hinge structure (13) is disposed between the bottom (9) and the first distal end (3); an axis of the hinge structure (13) is perpendicular to an extending direction of the first elongated slot (6); the first movable arm (7) is pivoted with the axis of the hinge structure (13) and forms a clip with the slot wall of the first elongated slot (6).

7. The hair curler according to claim 6, wherein, the hinge structure (13) further comprises a button (18); the button (18) is connected with the axis of the hinge structure through a connecting rod (181); the minimum distance between the slot wall of the first elongated slot (6) and the first movable arm (7) is at least 0.5mm.

8. The hair curler according to claim 1, wherein, the hair curler further comprises a handle member (20) and a rotatable structure (21) rotatably arranged on the first distal end (3).

9. The hair curler according to claim 8, wherein, the first elongated slot (6) extends from the first opening (8) to the first distal end (3); the hair curler further comprises a second movable arm (10) movably disposed in the first internal space (4); the first movable arm (7) and the second movable arm (10) are fixedly connected with the rotatable structure (21) respectively.

10. The hair curler according to claim 9, wherein, a gap (56) is formed at the first opening (8) of the first proximal end (2); the gap (56) extends from the first opening (8) to the first distal end (3); an extending length of the gap (56) is shorter than an extending length of the first elongated slot (6).

11. The hair curler according to claim 8, wherein, the first elongated slot (6) extends from the first opening (8) to the first distal end (3); the heating member for heating the hair (33) is arranged on a first heating arm (77).

12. The hair curler according to claim 11, wherein, the first heating arm (77) is fixedly connected with the rotatable structure (21).

13. The hair curler according to claim 12, wherein, the first heating arm (77) extends out of the first internal space (4).

14. The hair curler according to claim 13, wherein, the hair curler further comprises a second heating arm (710) fixedly connected with the rotatable structure (21); the second heating arm (710) extends out of the first internal space (4); when the rotatable structure (21) is rotated, the first heating arm (77) and the second heating arm (710) are rotated relative to the main body (1).

15. The hair curler according to claim 11, wherein, a radial width of the main body (1) narrows from the first proximal end (2) to the first distal end (3).

16. The hair curler according to claim 11, wherein, a width of the first elongated slot (6) in the circumferential direction of the main body (1) from the first proximal end (2) to the first distal end (3) increases first and then reduces; the first opening (8) and the first heating arm (77) form an annular opening; the first opening (8) forms two proximal corners at the first proximal end (2).

17. The hair curler according to claim 11, wherein, the first heating arm (77) is cylindrical; the first heating arm (77) extends out of the first internal space (4); the main body (1) is connected with the rotatable structure (21); when the rotatable structure (21) is rotated, the main body (1) is rotated relative to the first heating arm (77).

18. The hair curler according to claim 16, wherein, a radial width of the main body (1) narrows from the first proximal end (2) to the first distal end (3).

19. The hair curler according to claim 16, wherein, the main body (1) comprises an inner wall (97); a convex bone (99) is disposed on the inner wall; the convex bone (99) extends from the first proximal end (2) to

the first distal end (3).

20. The hair curler according to claim 16, wherein, the hair curler further comprises an external sleeve (51) coaxially disposed with the main body (1) and fixedly connected with the handle member (20); the external sleeve (51) comprises a second proximal end (52) and a second distal end (53); a second elongated slot (54) is disposed on the external sleeve (51); a second opening (58) of the second elongated slot (54) is arranged on the second proximal end (52); the second elongated slot (54) extends from the second proximal end (52) to the second distal end (53).

21. The hair curler according to claim 20, wherein, a width of the second elongated slot (54) in the circumferential direction of the external sleeve (51) narrows from the second proximal end (52) to the second distal end (53).

22. The hair curler according to claim 20, wherein, a radial width of the external sleeve (51) narrows from the second proximal end (52) to the second distal end (53).

23. The hair curler according to claim 20, wherein, the main body (1) is connected with the rotatable structure (21); when the rotatable structure (21) is rotated, the main body (1) is rotated relatively to the external sleeve (51).

24. The hair curler according to claim 23, wherein, the hair curler further comprises a motor disposed on the handle member (20) for driving the rotatable structure (21); the hair curler further comprises a rotating position detecting device disposed on the handle member (20) for detecting a rotating position of the rotatable structure (21) and a control component; the control component is electronically connected with the motor and the rotating position detecting device respectively and is for controlling the rotatable structure (21) to return to an initial position after the hair curler stops working.

25. A method for using a hair curler, wherein, comprises the following steps:

S1) proving a hair curler, the hair curler comprises a main body (1); a first internal space (4) is formed inside the main body (1); the main body (1)comprises a first proximal end (2) and a first distal end (3); a first elongated slot (6) communicated with the first internal space (4) is formed on the first proximal end (2); the hair curler further comprises a heating member disposed inside the first internal space (4); a side wall of the main body (1) at the first proximal end (2) is a main body outer wall (5) for cooling the hair (33);

S2) the hair (33) comprises hair root (22) and hair trip (23); putting a portion of the hair (33) closing to the hair root (22) into the first elongated slot (6), then rotating the main body (1) to make the hair (33) wound on the main body outer wall (5);

S3) then heating the portion of the hair (33) in the first elongated slot (6) by 所述 the heating member; moving the main body (1) in the direction of the hair trip (23); after separating from the first elongated slot (6), the portion of the hair (33) heated by the heating member contacts with the main body outer wall (5) to be cooled down to form a curled portion (24); an uncurled portion (25) of the hair (33) continues to be put into the first elongated slot (6) to be heated by the heating member;

S4) repeating step S3 to curl the hair (33).

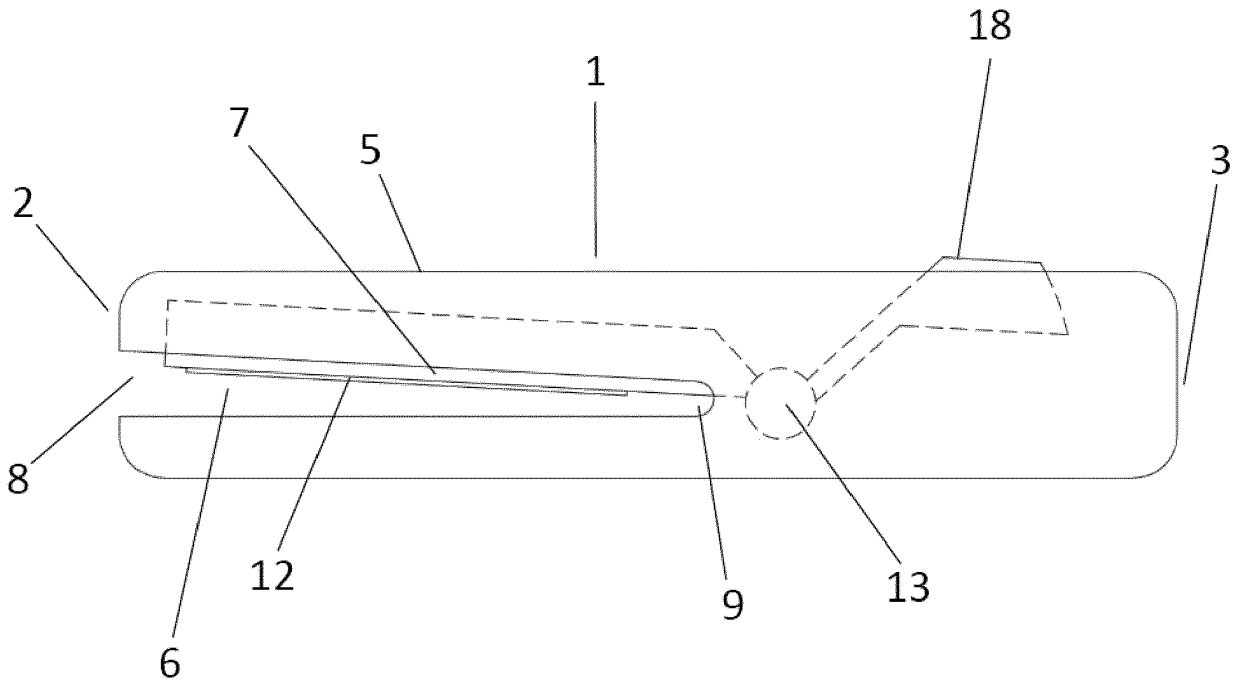


Figure 1

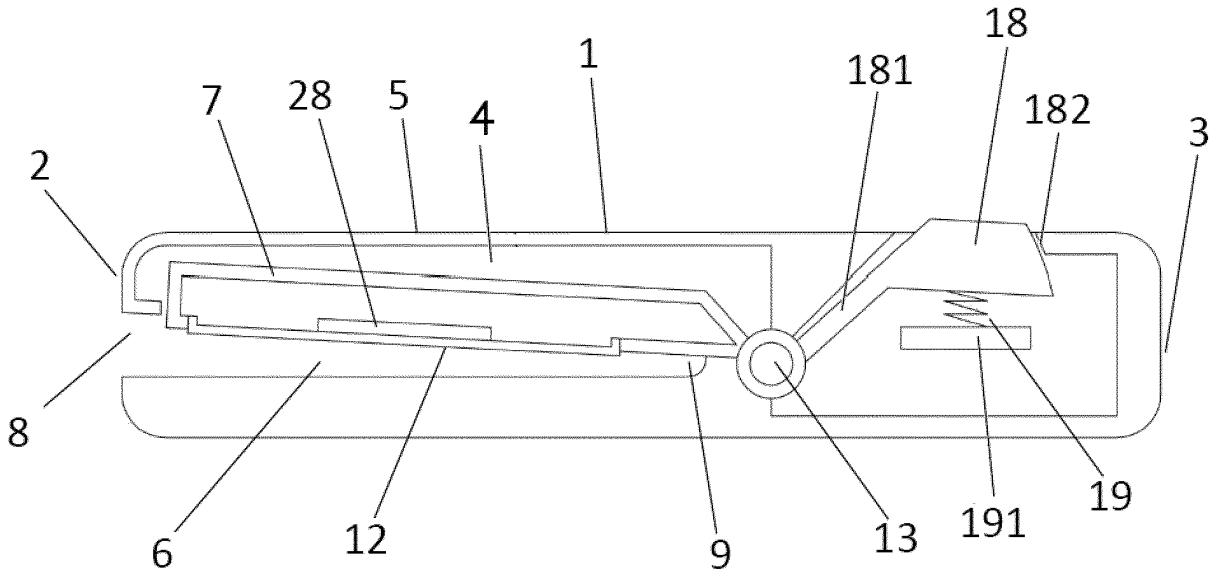


Figure 2

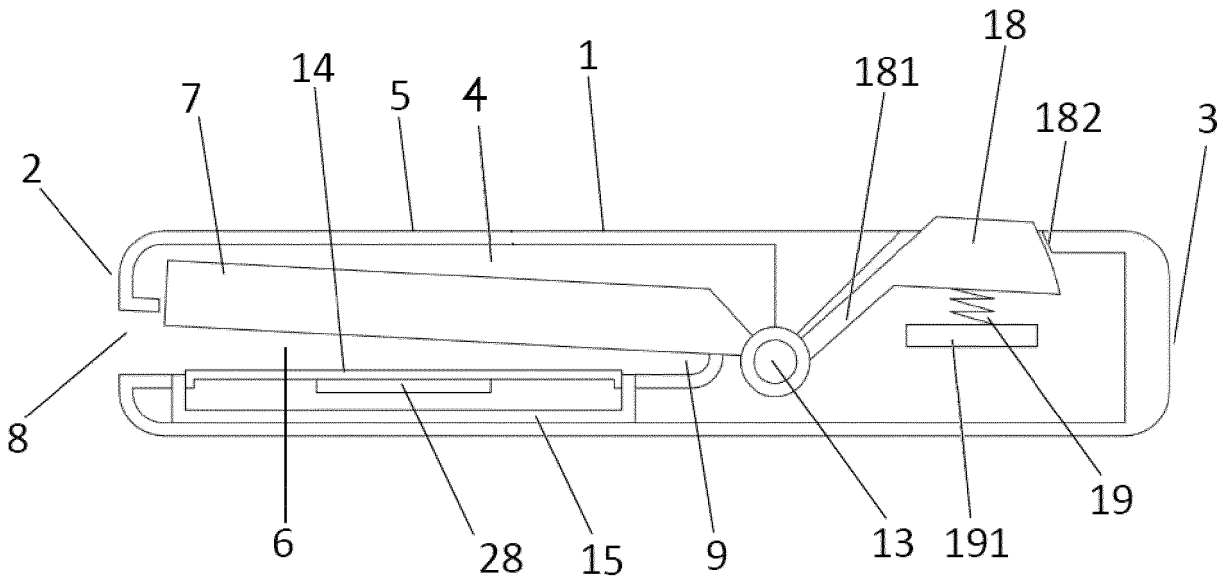


Figure 3

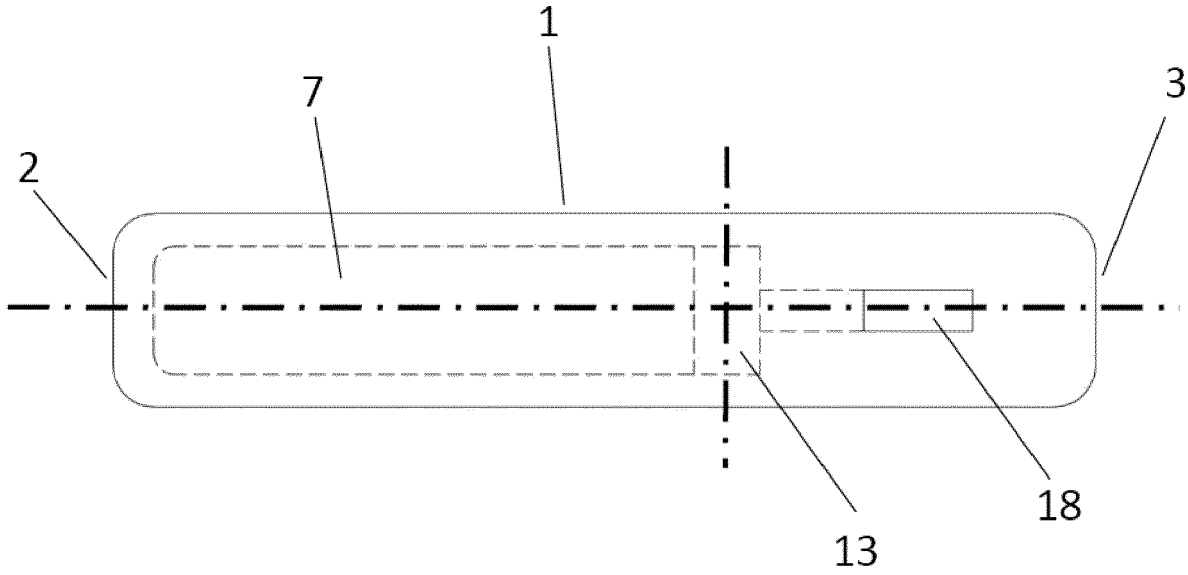


Figure 4

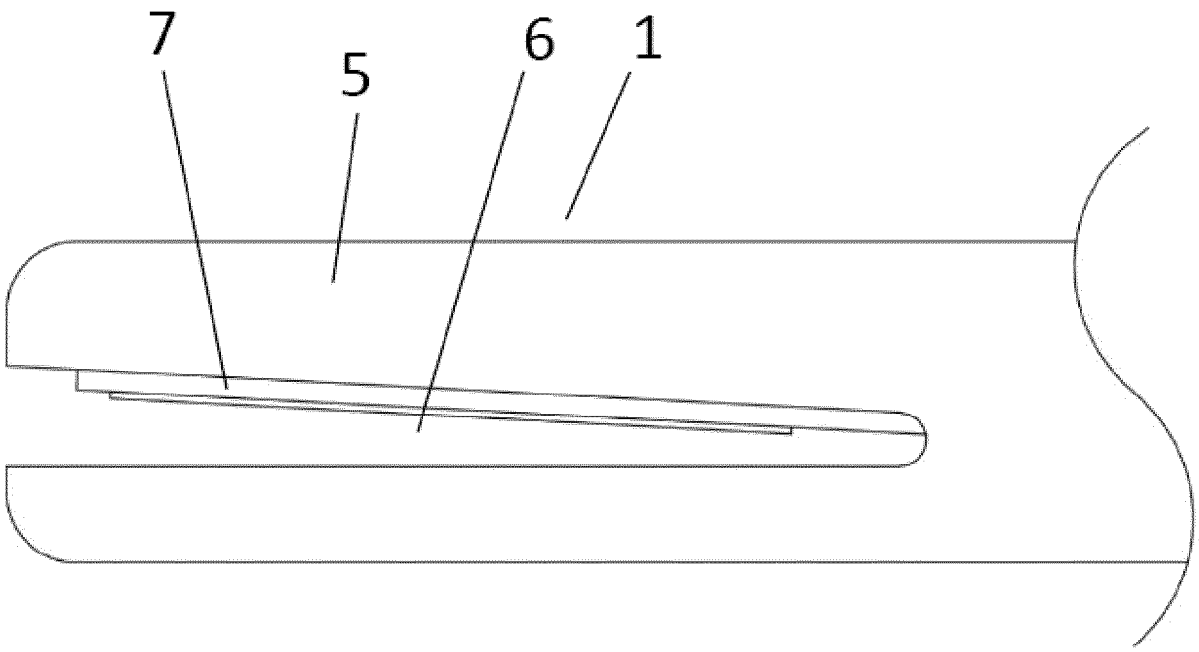


Figure 5

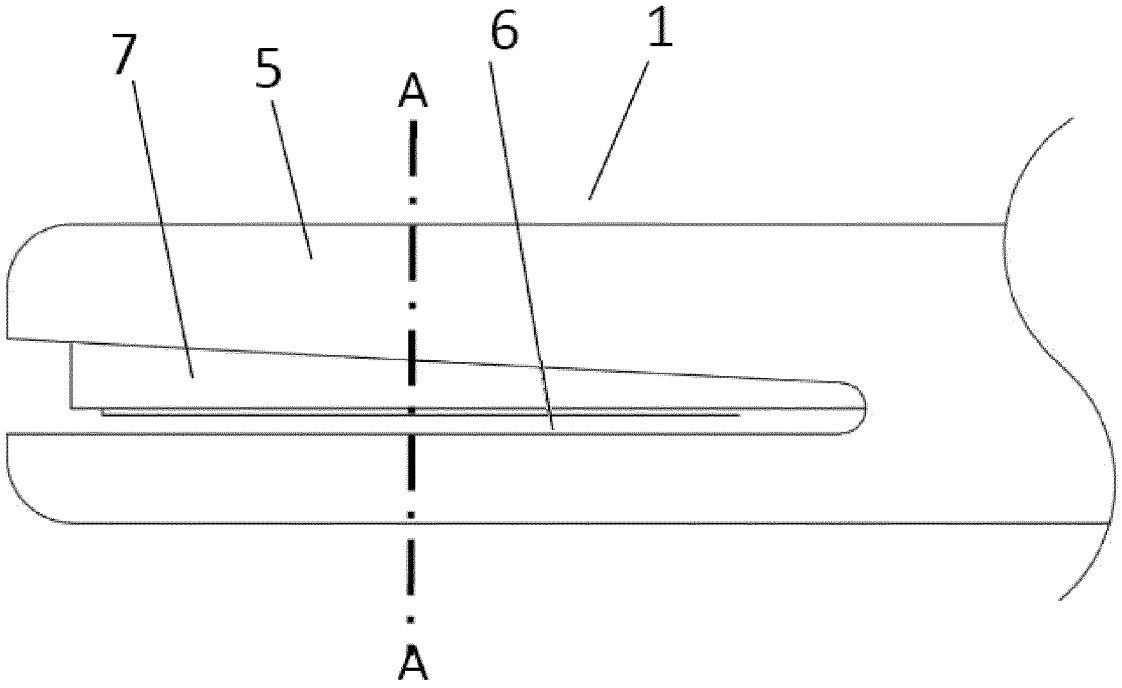


Figure 6

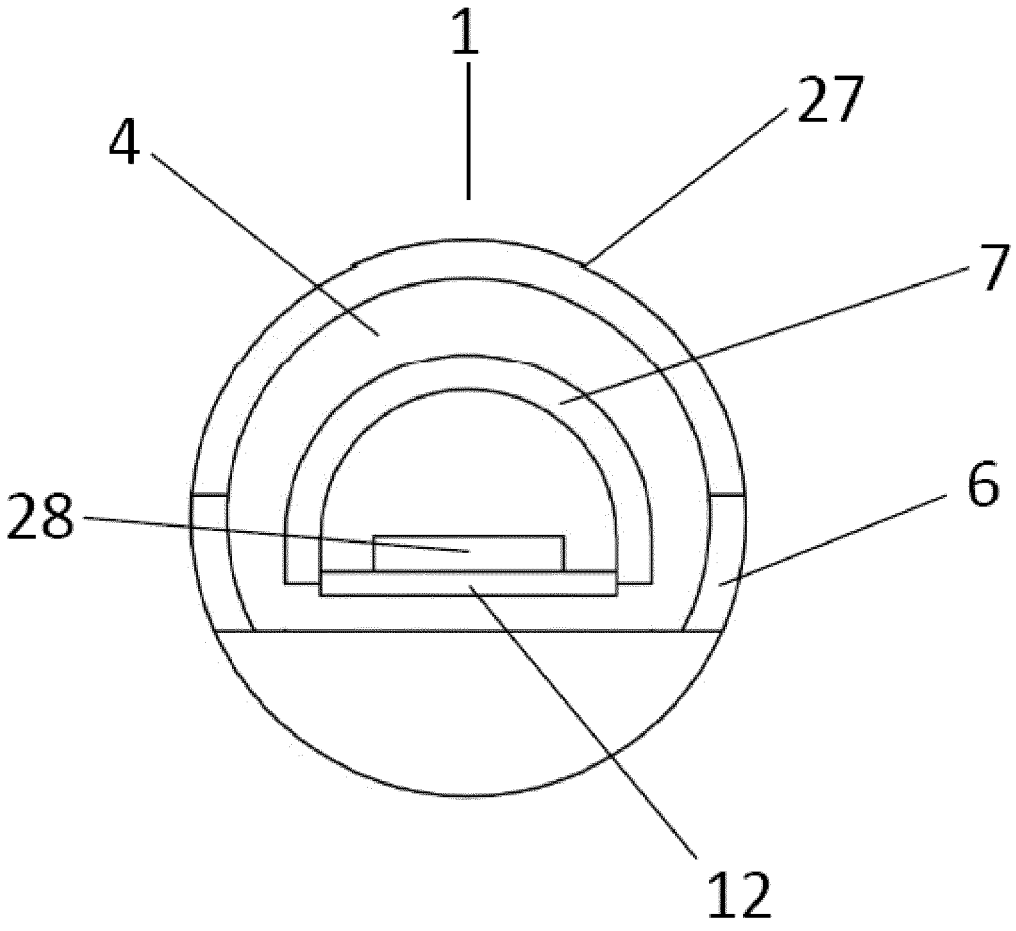


Figure 7

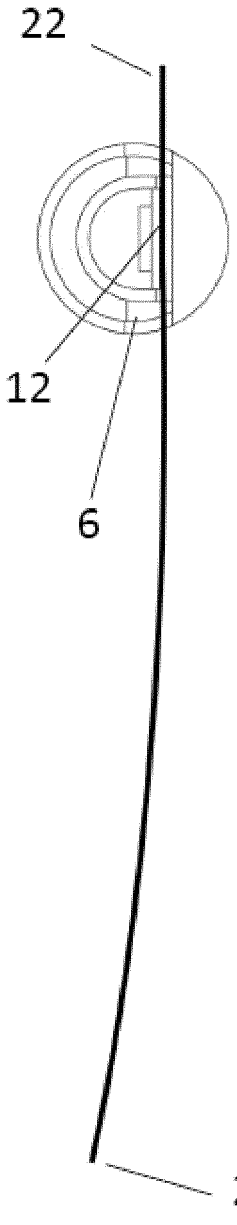


Figure 8

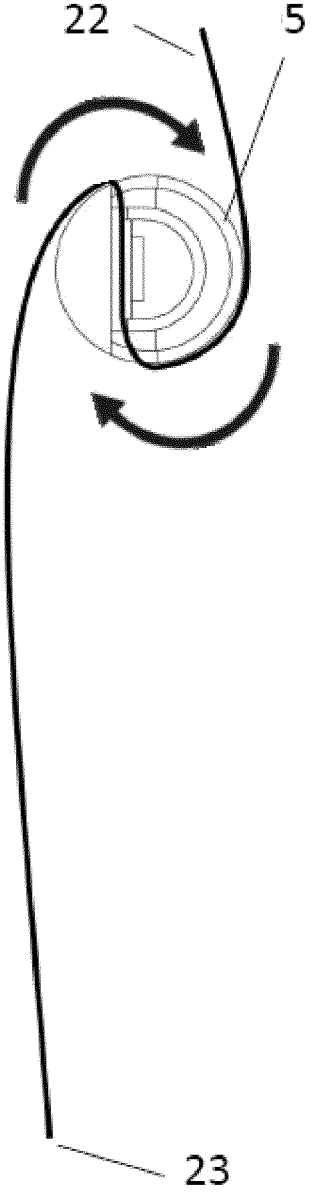


Figure 9

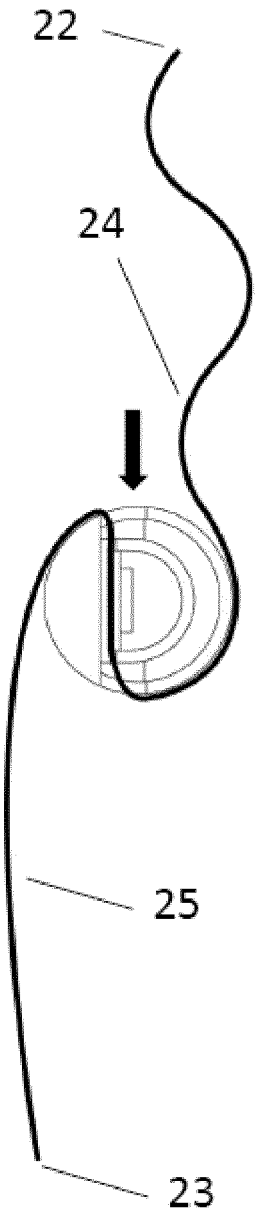


Figure 10

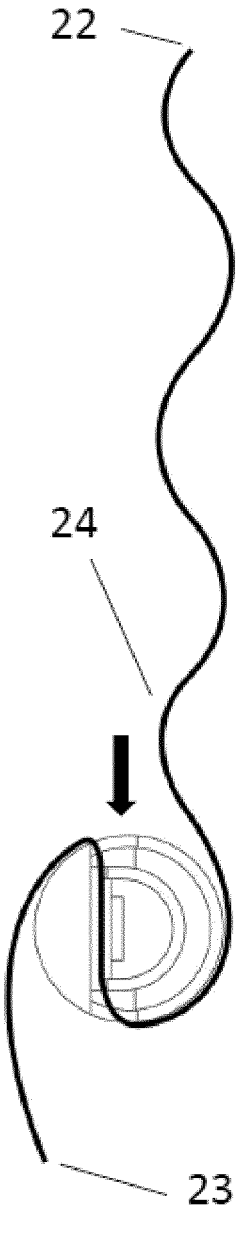


Figure 11

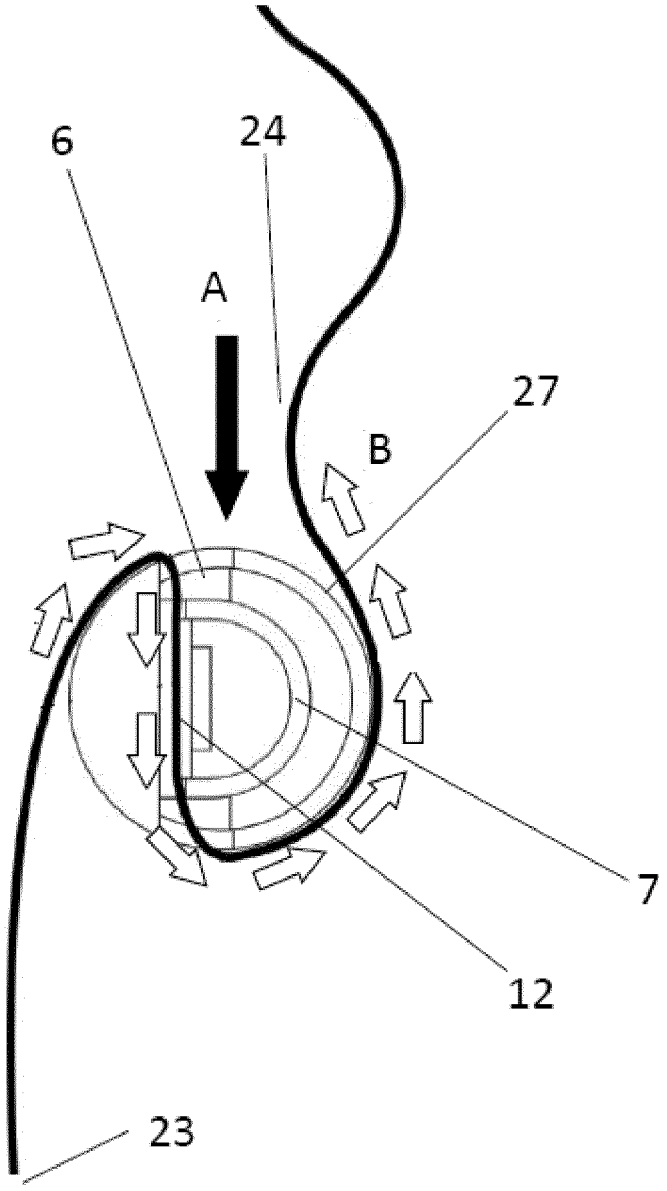


Figure 12

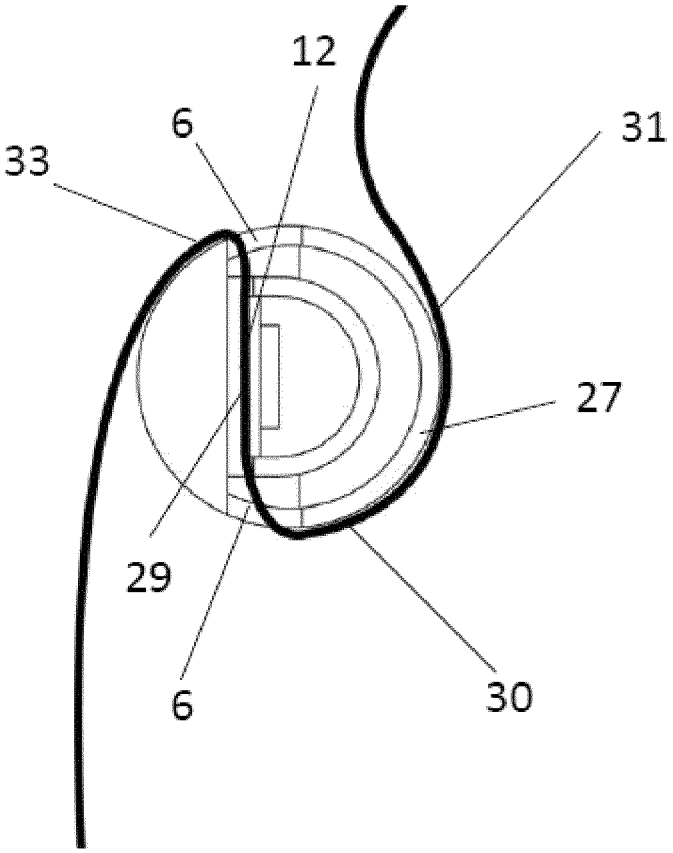


Figure 13

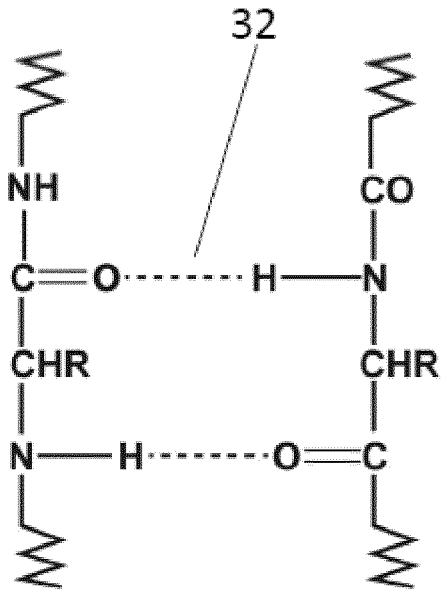


Figure 14

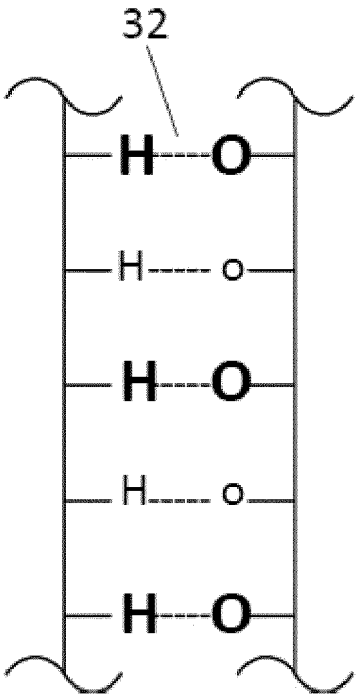


Figure 15

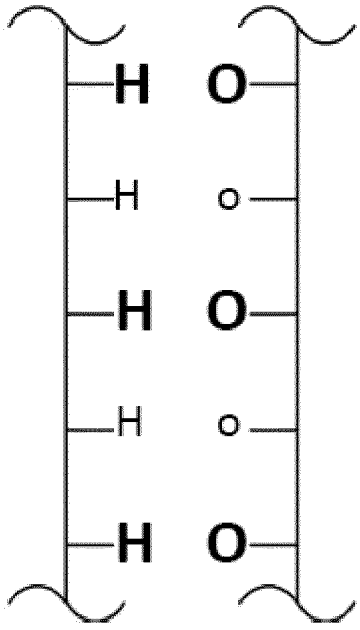
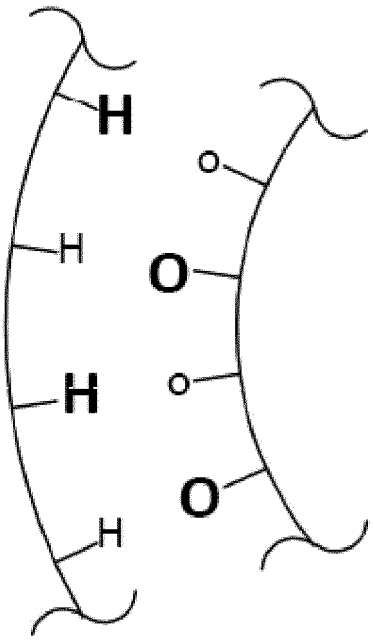


Figure 16



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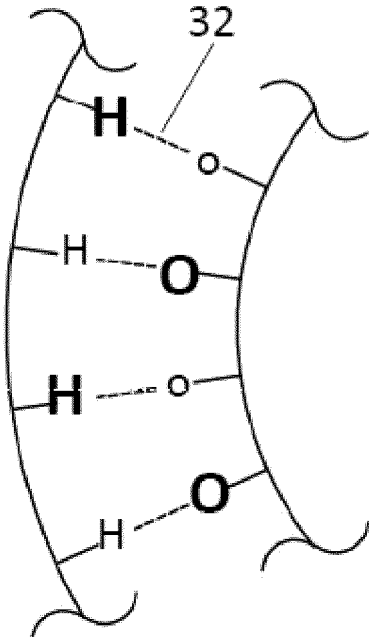

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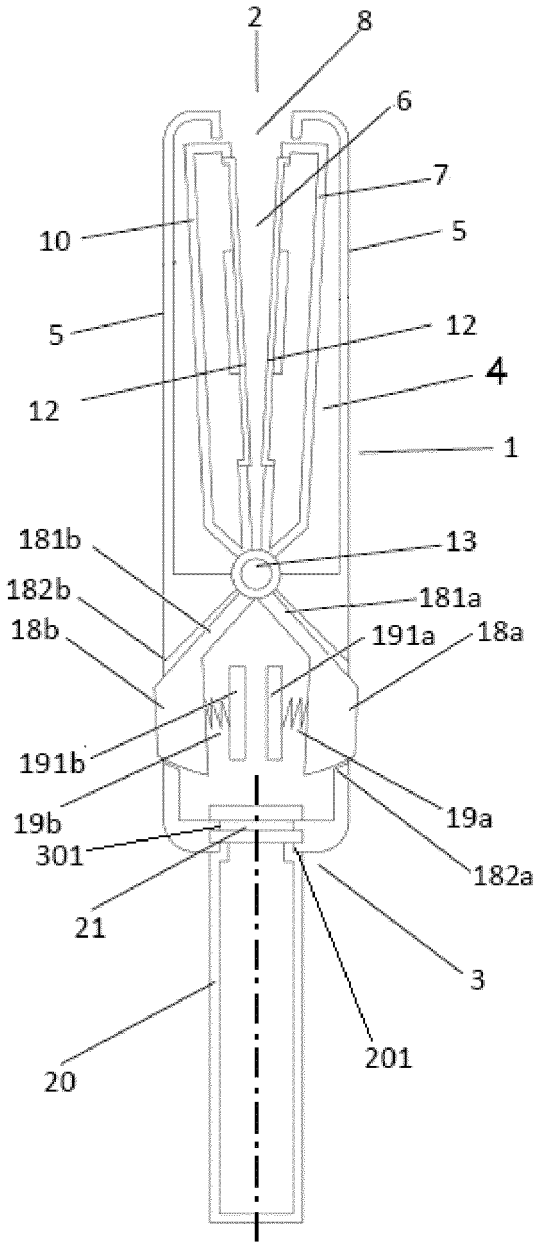
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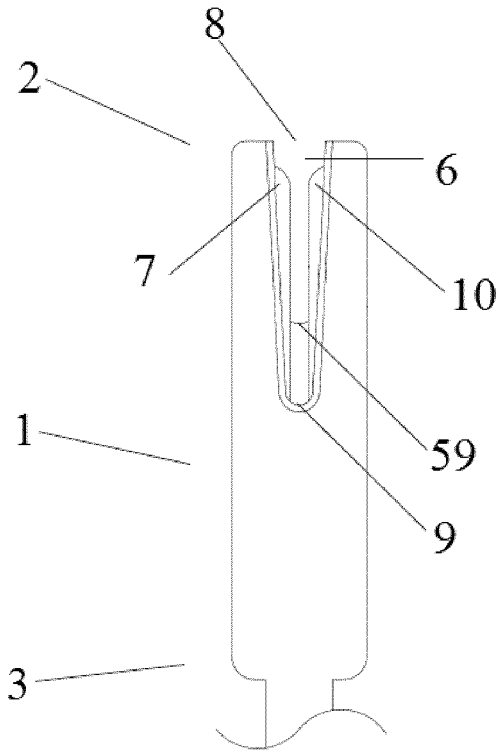
Figure 19



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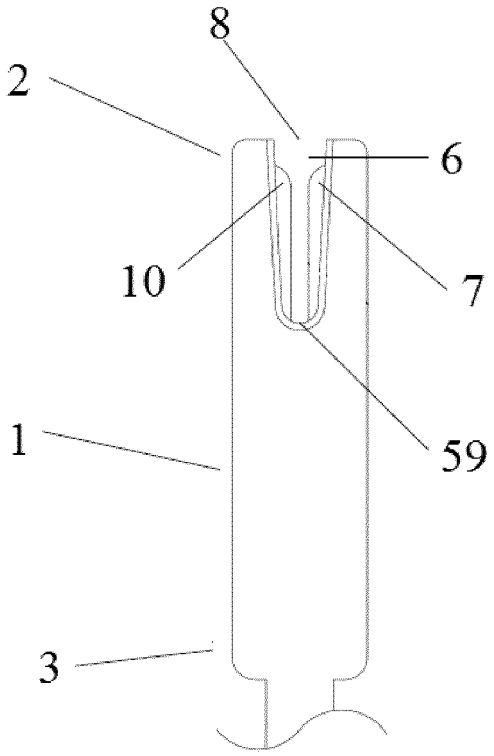

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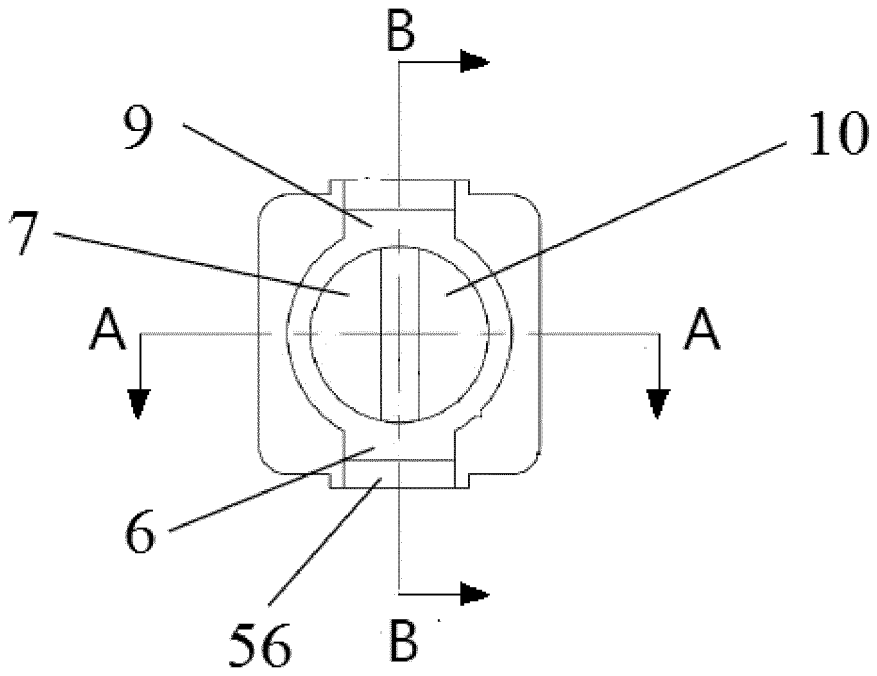

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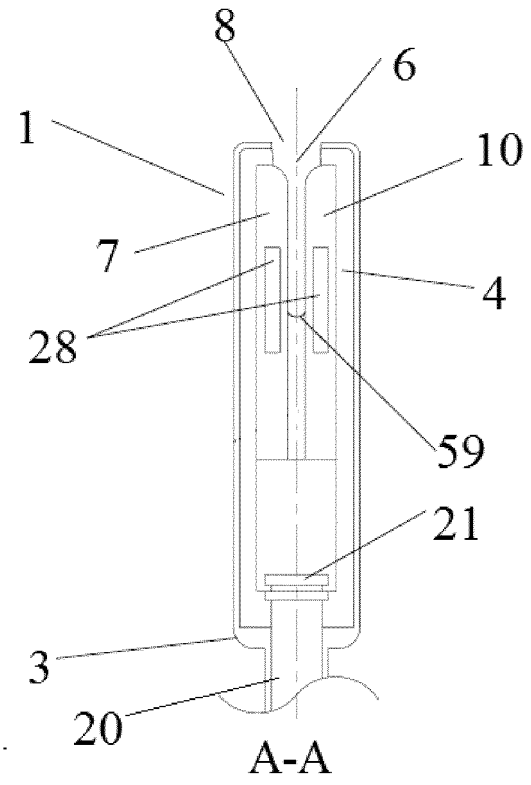

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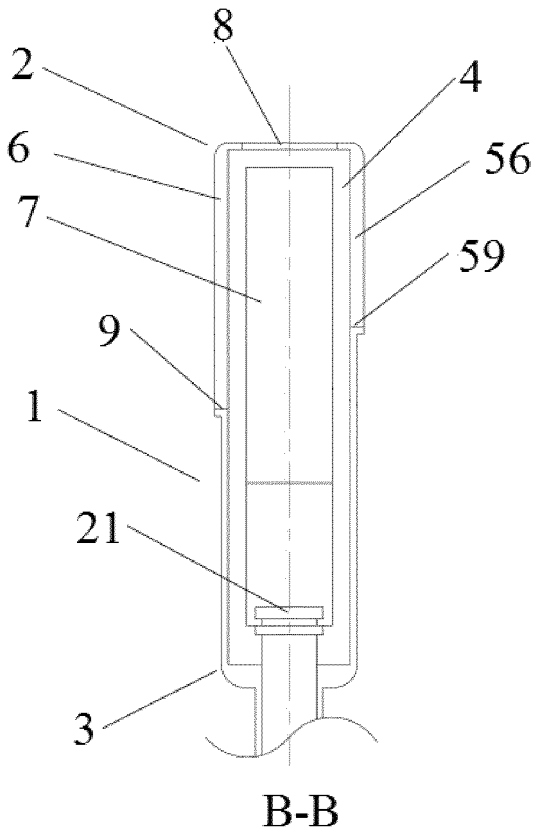

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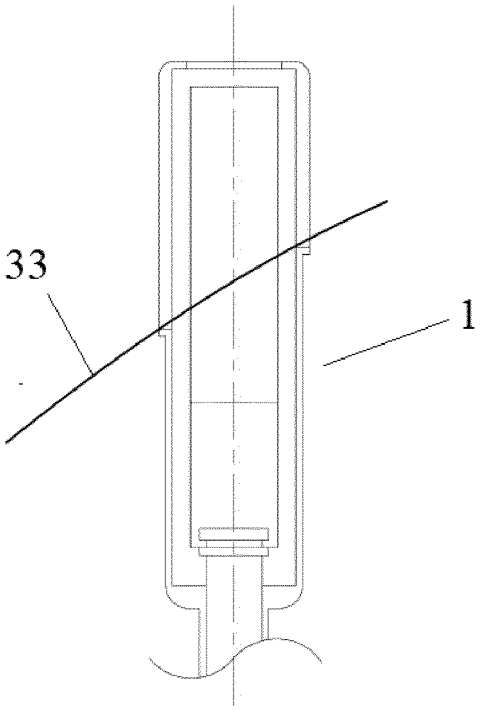

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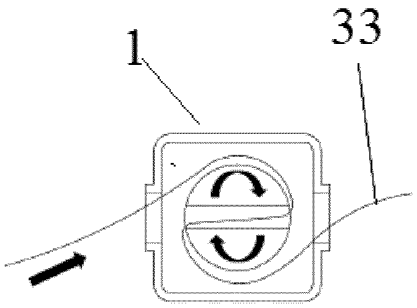

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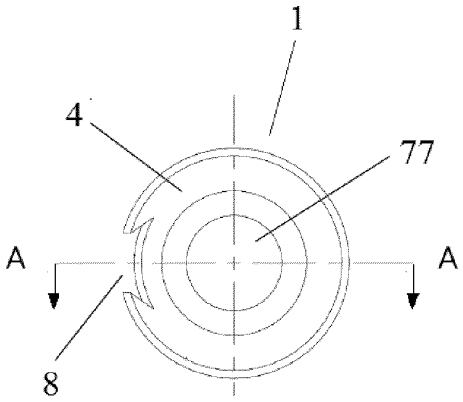

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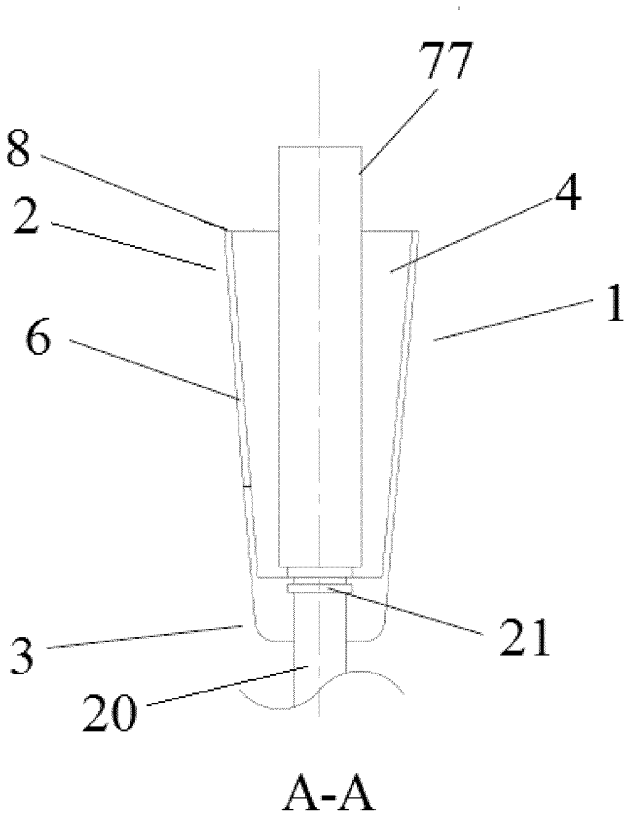

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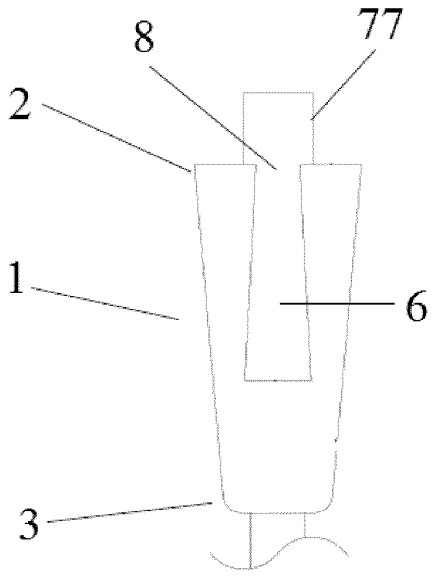

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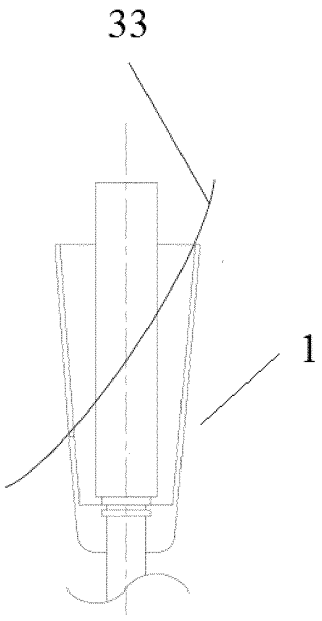

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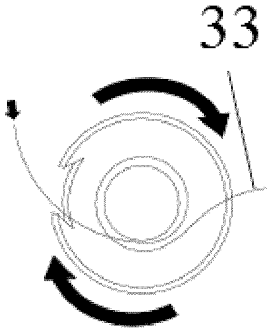

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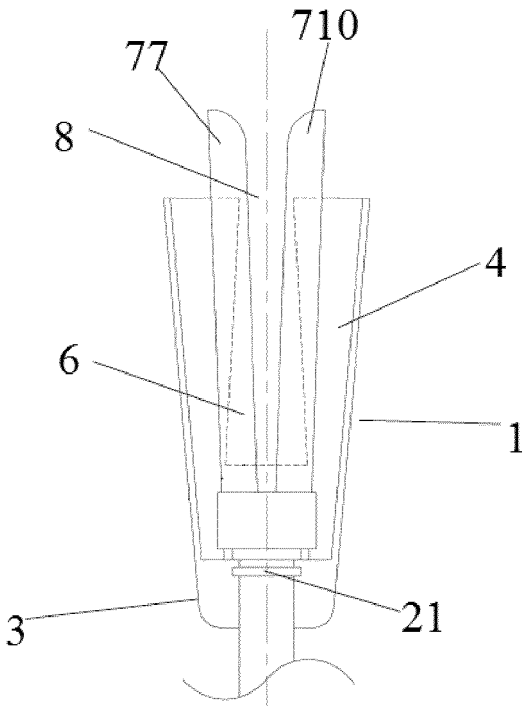

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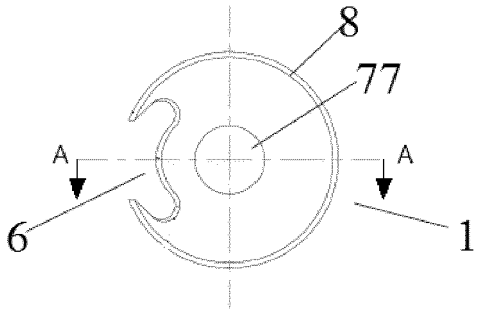
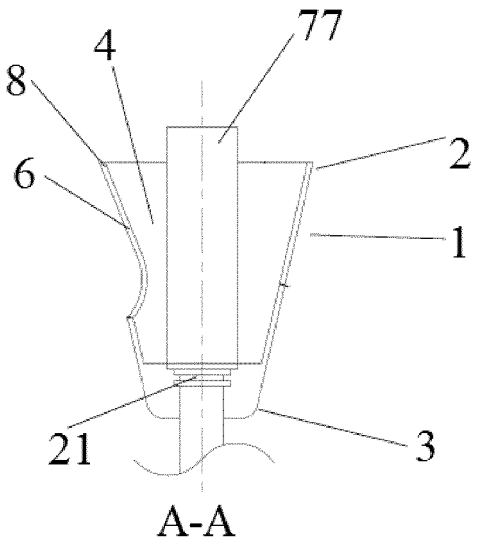


Figure 33



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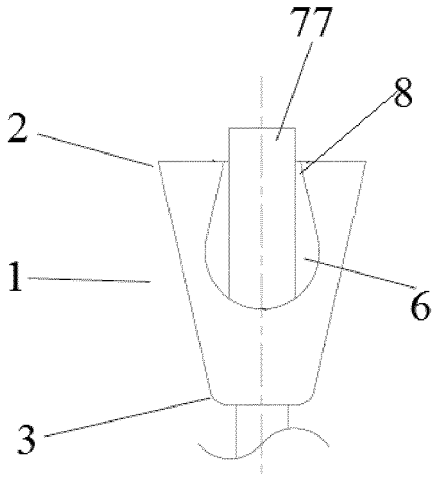

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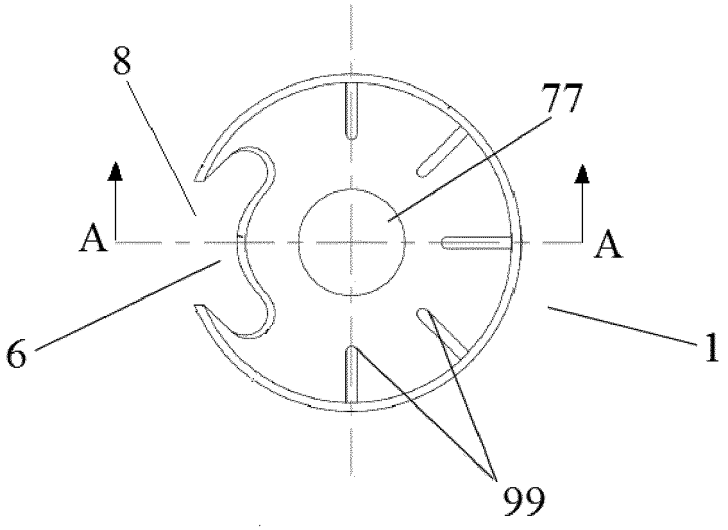

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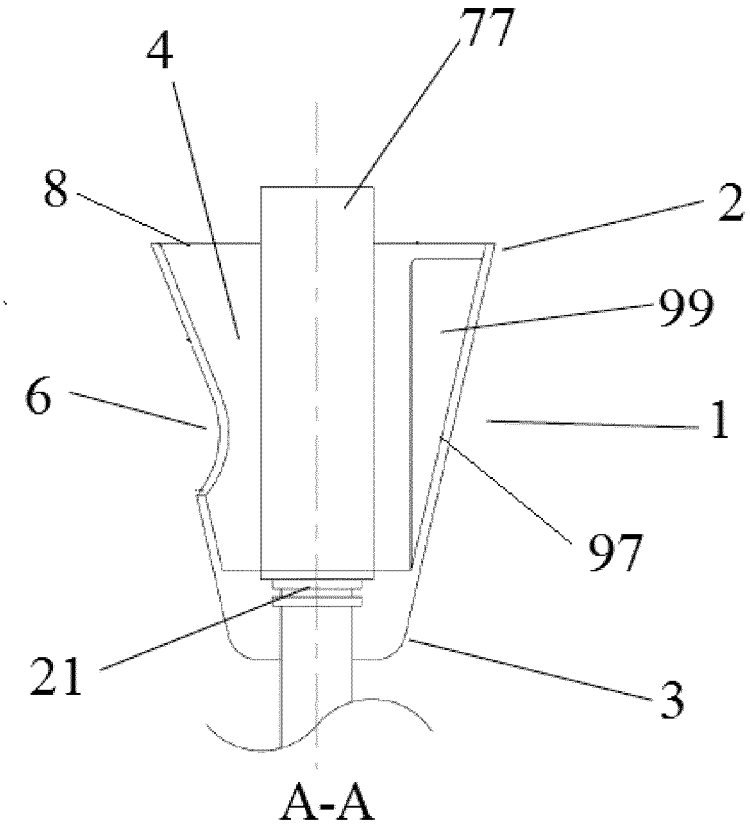

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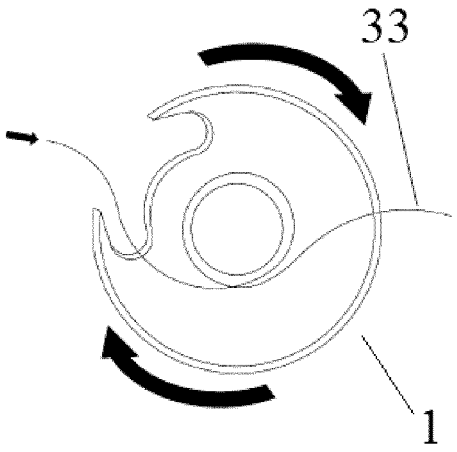

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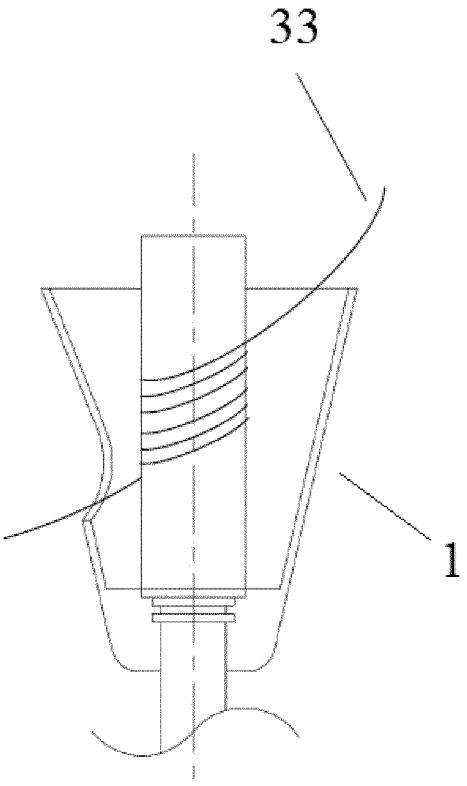

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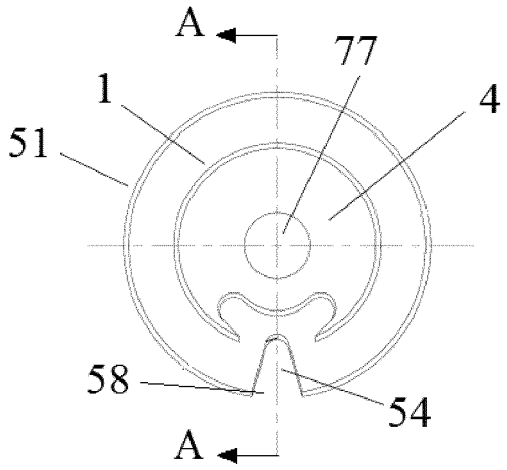

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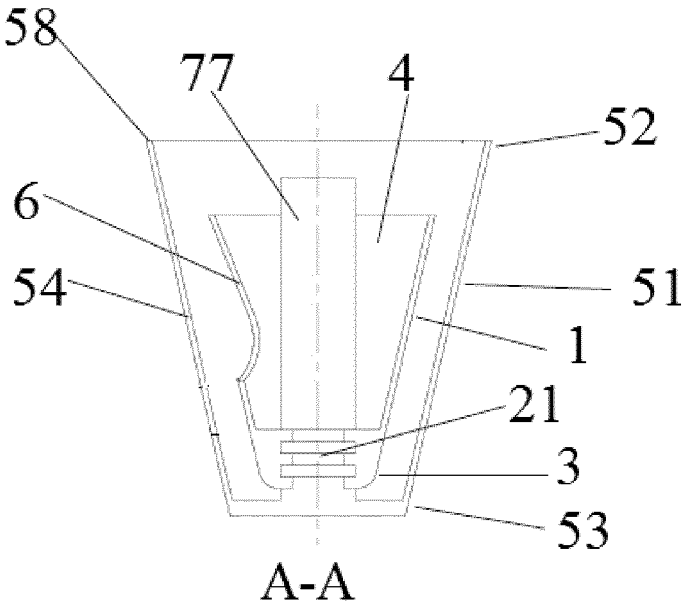

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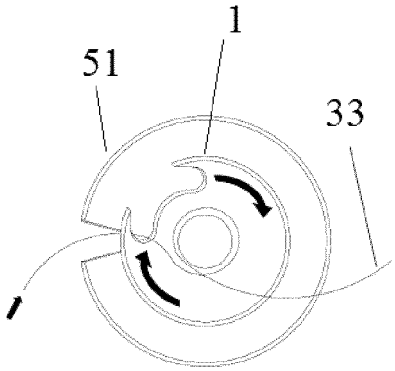

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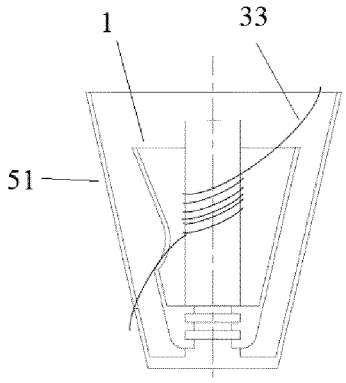

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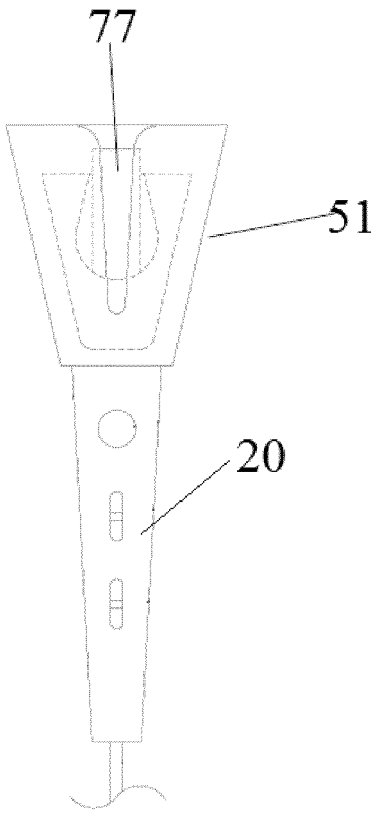

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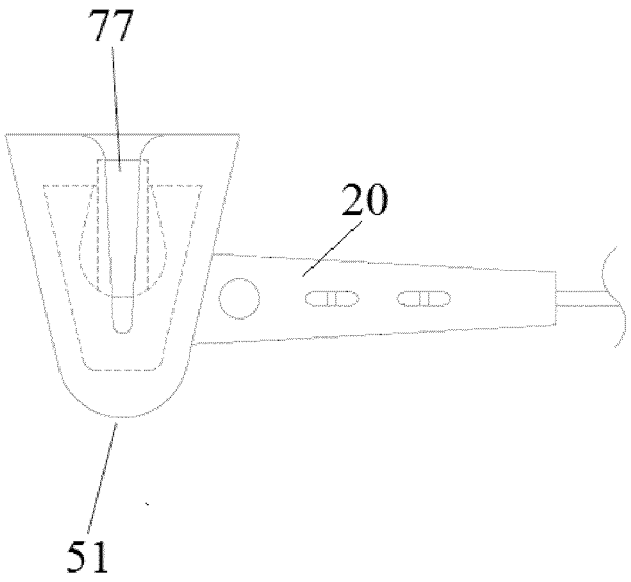

Figure 45

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2015/087788

A. CLASSIFICATION OF SUBJECT MATTER

A45D 1/04 (2006.01) i; A45D 2/12 (2006.01) i; A45D 7/02 (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 1/-; A45D 2/-; A45D 7/-

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
CNPAT, CHINA JOURNAL FULL-TEXT DATABASE, WPI, EPODOC: curly hair; curl+, hair, slot?, groove?, opening, arm, rod, bar, rotat+, hinge?, pivot+, heat+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 103099419 A (LI, Hanjiang), 15 May 2013 (15.05.2013), claims, description, page 2, and figures 1-4	1, 8, 11-13, 15, 17, 25
A	CN 103932476 A (TENACTA GROUP S.P.A), 23 July 2014 (23.07.2014), the whole document	1-25
A	EP 2641501 A1 (SEB S.A.), 25 September 2013 (25.09.2013), the whole document	1-25
A	CN 2056829 U (LI, Jinxing), 09 May 1990 (09.05.1990), the whole document	1-25
A	CN 103099418 A (WIK FAR EAST LTD.), 15 May 2013 (15.05.2013), the whole document	1-25
A	WO 2007094550 A1 (HAN, N.S.), 23 August 2007 (23.08.2007), the whole document	1-25
A	CN 101258962 A (SEB S.A.), 10 September 2008 (10.09.2008), the whole document	1-25

☐ 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 October 2015 (29.10.2015)	**27 November 2015 (27.11.2015)**
Name and mailing address of the ISA/CN: State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No.: (86-10) 62019451	Authorized officer **CHEN, Zhihong** Telephone No.: (86-10) **62413126**

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

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2015/087788

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 103099419 A	15 May 2013	None	
CN 103932476 A	23 July 2014	IT MI20130074 A1	22 July 2014
		US 2014202488 A1	24 July 2014
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		CN 101258962 B	13 June 2012
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		ES 2389523 T3	26 October 2012
		EP 1967088 A1	10 September 2008
		FR 2913317 B1	11 February 2011

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