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(54) **ROTATABLE ELECTRIC IRON AND HANGING IRONING MACHINE HAVING THE SAME**

(57) The rotatable iron and garment steamer with rotatable iron of the present invention relates to an iron and a garment steamer. The rotatable iron of the present invention, its main body has an electrical heater which is mounted with a housing, a revolver is rotatably connected to the main body and a handle, a position-limiting mechanism for restricting the rotational amplitude and a resilient positioning mechanism for locking the position

of rotational angle are both disposed between the main body and the handle. When the relative position of the handle and the main body is locked, said iron can be used as steam iron; after the main body is sleeved with a brush cover, the handle rotates relative to the main body; said iron can be used as a steam brush. It solves the prior's problems of the fixed relative position of the handle and the main body, the single using manner, and the requirements of flexible ironing could not be realized.

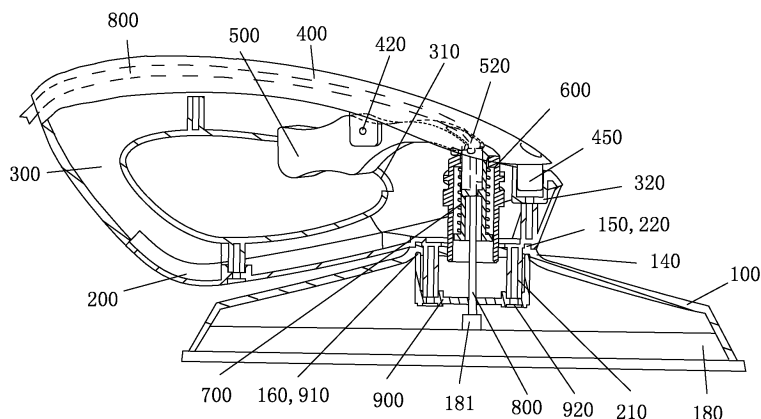


FIG. 12

Description

Field of the invention

[0001] The present invention relates to an iron and a garment steamer.

Background of the invention

[0002] The main body of the iron comprises a bottom plate and an electric heater. The housing of the main body is fixed with a handle which is convenient for lifting and sliding or moving the iron during operation. The axis of the handle overlaps with the axis of the main body along the same direction of the axis of the main body. When the user irons the clothes, he has to turn over his wrist to rotate the iron for adjustment, so the user will feel uncomfortable when his wrist is twisted with certain angle for a long time. Thereby, the user hopes the handle of iron can rotate relative to the main body. However, the relative position of the handle of existing iron and the main body is fixed; it can not meet the user's above requirement. Besides, the existing garment steamer transports steam to the iron with a boiler comprises a water tank and a heater through a pipeline, the boiler has a rack for detachably supporting said iron. The housing of the main body of the iron is fixed with a handle; the axis along the lengthwise direction of the handle is vertical to the axis along the lengthwise direction of the main body. In operation, the main body of said iron is sleeved with a brush cover. The steam transported through the pipeline will spray out of the air outlet of the bottom plate of the main body after re-heated by the main body, the brush of the brush cover of the main body of said iron will cooperate with the steam when the user moves the iron on the hanging clothes, so the clothes will be smooth quickly. However, when the user needs to directly use the iron, it will be uncomfortable even the brush cover is removed from the main body. So the user hopes to promote the existing iron and garment steamer, wherein the handle of the iron can rotate relative to the main body in the promotion, and achieves more using manners and functions.

Summary of the invention

[0003] The object of the present invention is to provide a rotatable iron, the handle of which can rotate for adjustment according to the ironing requirements of the user.

[0004] Another object of the present invention is to provide a garment steamer with a rotatable iron, the handle of iron can rotate relative to the main body, thus is has more using manners and functions.

[0005] The technical solution of the present invention is: a rotatable iron comprising a main body having an electrical heater, said main body is mounted with a housing, a revolver is rotatably connected to the main body

and a handle, a position-limiting mechanism for restricting the rotational amplitude and a resilient positioning mechanism for locking the position of rotational angle are both disposed between the main body and the handle.

[0006] Said revolver is a box-shaped revolving cover; said housing has an opening corresponds to the revolving cover; the revolving cover is installed under the housing, and the handle above the revolving cover and the housing passes through said opening with a fastener for fixed connection; the housing has a circular groove on the bottom surface of the opening to cooperate with a circular flange on the top surface of the revolving cover; the housing has a circular groove on top surface of the opening to cooperate with a circular flange on the bottom surface of the handle to form a coaxial rotational connection between the handle and the housing and between the revolving cover and the housing. A circular groove and a circular flange are disposed between the handle and the housing and cooperate with each other to form a rotational connection, a circular groove and a circular flange are disposed between the housing and the revolving cover and cooperate with each other to form a rotational connection, and the handle is fixed with the revolving cover, so the handle can rotate steadily and reliably relative to the housing, that is the main body, it will be convenient for the user to do the corresponding ironing. Said structure is simple and easy for assembling.

[0007] In order to make the handle rotate conveniently: the axis of said revolving cover is vertical to the bottom surface of the main body and is located from 1/3 to 1/2 of the lengthwise direction of the main body.

[0008] In another preferred embodiment, a simple resilient positioning mechanism is recommended: said resilient positioning mechanism comprises at least two retaining cavities disposed on the wall of the inner hole of the revolving cover and a spring tap fixed on the main body, said spring tap has an extension end retained in one of said optional retaining cavities.

[0009] In this preferred embodiment, a simple position-limiting mechanism is recommended: said position-limiting mechanism comprises a curving groove disposed on the main body, and a position-limiting block disposed on the bottom surface of the revolving cover and extends into said curving groove, the movement path of the curving groove corresponds to the movement path of said position-limiting block.

[0010] In another preferred embodiment, a position-limiting mechanism adaptable for automatic rotation is: said position-limiting mechanism comprises a trapezoidal revolving guiding groove disposed on the outer circumferential surface of a guiding canister and a position-limiting block disposed on the handle and extends into said trapezoidal revolving guiding groove; said guiding canister is installed on the handle with a rotational shaft, the two parallel sides of said trapezoidal revolving guiding groove are parallel to the axis of the guiding canister, the movement path of said position-limiting block between two sloping sides of said trapezoidal revolving guiding

groove are respectively correspond to the amplitude of a first and second rotational direction(正反向) of the guiding canister relative to the handle.

[0011] In the automatic rotational mechanism, a recommended structure of the resilient positioning mechanism is: said resilient positioning mechanism comprises a spring disposed on the rotational shaft of the guiding canister and upward biased against the guiding canister, a protrude positioning point disposed on the lowest point of the upper sloping side of the trapezoidal revolving guiding groove for stopping the position-limiting block of the handle, a sliding key disposed on the lower part of the outer circumferential surface of the guiding canister and a guiding hole disposed on the housing for receiving the guiding canister and its sliding key; the sliding key on the guiding canister cooperates with a sliding key groove of a guiding hole on the housing, so the connection between the guiding canister the main body can make them parallelly move to each other and rotate together; said spring biases against the guiding canister to make the position-limiting block retained in the lowest point of the lower sloping side of the trapezoidal revolving guiding groove or in the protrude positioning point of the lowest point of the upper sloping side.

[0012] In the automatic rotational mechanism, in order to realize the operation: the upper end surface of said guiding canister has at least two V-shaped grooves continuously extend along its periphery, a lever-type key is disposed on the handle, the front end of said lever-type key abuts against one of said optional V-shaped grooves. When exerting a pressure to the rear half part of the key, the front end of the key will press the declining surface of first V-shaped groove of the guiding canister, so the guiding canister will parallelly move downward, the spring in the guiding canister will be compressed, the position-limiting block of the front end of the handle will be raised to the top point along the long straight side of the trapezoidal revolving guiding groove; then the front end of the key moves to the lowest point of first V-shaped groove along the declining surface of the first V-shaped groove sideways and downward, the guiding canister will rotate. Releases the key, then the rebound force of the spring will push against the guiding canister upward; the position-limiting block of the front end of the handle will move along the upper sloping side of the trapezoidal revolving guiding groove of the guiding canister sideways and downward, the guiding canister will rotate. The front end of the key will move along the ascending surface of the first V-shaped groove sideways and upward. When the position-limiting block moves to the lowest point of the upper sloping side of the trapezoidal revolving guiding groove, it will be stopped by the protrude positioning point, the spring will not stretch accordingly. The guiding canister will rotate with a predetermined angle along a first direction. Meanwhile the front end of the key has passed the ascending surface of the first V-shaped groove and enters the declining surface of the second V-shaped groove. Exerting a pressure to the rear half part

of the key again, the front end of the key will downwardly press the declining surface the second V-shaped groove of the guiding canister, the guiding canister will parallelly move downwardly, the spring in the guiding canister will be compressed, the position-limiting block of the handle will pass the protrude positioning point of the upper sloping side of the trapezoidal revolving guiding groove; the guiding canister will rotate with a small amplitude. Then the front end of the key will move along the declining surface of the second V-shaped groove sideways and downwardly, the position-limiting block will be stopped after it arrives at the upper end of the short straight side of the trapezoidal revolving guiding groove. When releasing the key, the rebound force of the spring will push against the guiding canister upward; the position-limiting block of the front end of the handle will move to the lowest point along the lower sloping side of the trapezoidal revolving guiding groove, the guiding canister will rotate along a second direction. The front end of the key moves sideways and upward along the declining surface of the second V-shaped groove and then passes the declining surface of the second V-shaped groove to enter the ascending surface of the first V-shaped groove. When the position-limiting block moves to the lowest point along the lower sloping side of the trapezoidal revolving guiding groove, it will be stopped by the long straight side and the spring will not stretch. The guiding canister will rotate with a predetermined angle along a second direction and back to its original position. Meanwhile the front end of the key has arrived at the upper part of the declining surface of the first V-shaped groove to prepare the next rotation cycle. Thereby the user can utilize the key to control the guiding canister to rotate along the first and second direction quickly, that is the handle will be controlled to rotate relative to the main body smartly so as to meet the ironing requirements.

[0013] The garment steamer with rotatable iron of the present invention, the boiler of which including a water tank and a heater transports the steam to the iron with a pipeline; the boiler has a rack for supporting said iron or detachable said iron from rack; a main body of said iron has an electrical heater and is mounted with a housing, a revolver is rotatably connected the main body and the handle, a position-limiting mechanism for restricting the rotational amplitude, and a resilient positioning mechanism for locking the position of the rotational angle are both disposed between the main body and the handle; a flexible pipe communicates with the pipeline and an air inlet of the main body; said main body is detachably sleeved with a brush cover. The handle can rotate relative to the main body, when the relative position of the handle and the main body is locked, said iron can be used as steam iron; after the main body is sleeved with a brush cover, said iron can be used as steam brush.

[0014] Said revolver is a box-shaped revolving cover; the housing has an opening corresponds to the revolving cover which is mounted under the housing, and the handle above the revolving cover and above the housing

passes through said opening with a fastener for fixed connection; the housing has a circular groove on the bottom surface of the opening to cooperate with a circular flange on the top surface of the revolving cover; the housing has a circular groove on the top surface of the opening to cooperate with a circular flange on the bottom surface of the handle, thus forms a coaxial rotational connection between the handle and the housing and between the revolving cover and the housing.

[0015] In a preferred embodiment, a simple resilient positioning mechanism is recommended: said resilient positioning mechanism comprises at least two retaining cavities disposed on the wall of the inner hole of the revolving cover and a spring tap fixed on the main body, said spring tap has an extension end retained in one of said optional retaining cavities.

[0016] In this preferred embodiment, a simple position-limiting mechanism is recommended: said position-limiting mechanism comprises a curving groove disposed on the main body, and a position-limiting block disposed on the bottom surface of the revolving cover and extends into said curving groove, the movement path of the curving groove corresponds to the movement path of said position-limiting block.

[0017] In another preferred embodiment, a position-limiting mechanism adaptable for automatic rotation is: said position-limiting mechanism comprises a trapezoidal revolving guiding groove disposed on the outer circumferential surface of a guiding canister and a position-limiting block disposed on the handle and extends into said trapezoidal revolving guiding groove; said guiding canister is installed on the handle with a rotational shaft, the two parallel sides of said trapezoidal revolving guiding groove are parallel to the axis of the guiding canister, the movement path of said position-limiting block between two sloping sides of said trapezoidal revolving guiding groove are respectively correspond to the amplitude of a first and second rotational direction of the guiding canister relative to the handle.

[0018] In the automatic rotational mechanism, a recommended structure of the resilient positioning mechanism is: said resilient positioning mechanism comprises a spring disposed on the rotational shaft of the guiding canister and upward biased against the guiding canister, a protrude positioning point disposed on the lowest point of the upper sloping side of the trapezoidal revolving guiding groove for stopping the position-limiting block of the handle, a sliding key disposed on the lower part of the outer circumferential surface of the guiding canister and a guiding hole disposed on the housing for receiving the guiding canister and its sliding key; the sliding key on the guiding canister cooperates with a sliding key groove of a guiding hole on the housing, so the connection between the guiding canister the main body can make them parallel move to each other and rotate together; said spring pushes against the guiding canister to make the position-limiting block retained in the lowest point of the lower sloping side of the trapezoidal revolving guiding groove

or in the protrude positioning point of the lowest point of the upper sloping side.

[0019] In the automatic rotational mechanism, in order to realize the operation: the upper end surface of said guiding canister has at least two V-shaped grooves continuously extend along its periphery, a lever-type key is disposed on the handle, the front end of said lever-type key abuts against one of said optional V-shaped grooves.

[0020] The rotatable iron of the present invention, it utilizes a revolver to rotatably connected to the main body and a handle. The resilient positioning mechanism can not only lock the chosen position after rotation, which is convenient for the user to do corresponding ironing; but it can also be used after the handle has rotated in an optional unlocking position to be adjusted and positioned. The iron will meet the requirement of the user to achieve two ironing widths by temporally adjusting the relative angle status of the longitudinal axis between the handle and the main body and then be locked. The iron can be utilized more flexibly, the part of clothes which is difficult to be ironed will now be easily ironed, and the ironing quality is higher. Furthermore, by adjusting the angle of the longitudinal axis between the handle and the main body, and sleeving a brush cover to the main body, the iron can be used as a steam brush, and the angle between the brush cover and the handle can be flexibly adjusted, thus the sweeping width of the steam brush can be adjusted freely. Especially after utilizing an automatic rotational mechanism controlled with a key, the user's hand will not have to contact the hot main body to adjust the angle between the main body and the handle; the using manner of the rotatable iron of the present invention is more convenient and safer. The garment steamer with rotatable iron of the present invention utilizes above rotatable iron, the ironing width can be adjusted by changing the angle between the lengthwise direction of the main body and the lengthwise direction of the handle; it can not only be used as a steam brush, but also be used as an iron. Thereby said garment steamer has advantages such as multiple using manners and higher functionality.

Brief description of the drawings

[0021] Fig.1 is the exploded structural view of a portion relative to the rotational handle device in an embodiment of the rotatable iron of the present invention.

[0022] Fig.2 is the top structural view of a portion relative to the rotational handle device in the embodiment of fig.1 of the rotatable iron of the present invention.

[0023] Fig.3 is the sectional structural view of a portion relative to the rotational handle device in the embodiment of fig.1 of the rotatable iron of the present invention.

[0024] Fig.4 is the assembly relation view of the rotational handle device in the embodiment of fig.1 of the rotatable iron of the present invention.

[0025] Fig.5 is the assembly relation view of the substrate of the main body, the spring tap and the pressing

plate in the embodiment of fig.1 of the rotatable iron of the present invention.

[0026] Fig.6 is the assembly relation view of the revolving cover, the spring tap and the pressing plate in the embodiment of fig. 1 of the rotatable iron of the present invention.

[0027] Fig.7 is the assembly relation view of the revolving cover, the substrate of the main body, the spring tap and the pressing plate in the embodiment of fig.1 of the rotatable iron of the present invention.

[0028] Fig.8 is the perspective view of a portion relative to the rotational handle device in the embodiment of fig. 1 of the rotatable iron of the present invention when the lower handle is in a normal position.

[0029] Fig.9 is the perspective view of a portion relative to the rotational handle device in the embodiment of fig. 1 of the rotatable iron of the present invention when the lower handle rotates with 90°.

[0030] Fig.10 is the top structural view in the embodiment of fig.1 of the rotatable iron of the present invention when the handle is in normal position.

[0031] Fig.11 is the top structural view in the embodiment of fig.1 of the rotatable iron of the present invention when the main body is sleeved with a brush cover and the handle rotates with 90°.

[0032] Fig.12 is the sectional structural view of another embodiment of the rotatable iron of the present invention.

[0033] Fig.13 is the exploded structural view of embodiment in fig.12 of the rotatable iron of the present invention.

[0034] Fig.14 is the structural view of embodiment in fig.12 of the rotatable iron of the present invention when a portion relative to the rotational handle device is in original position.

[0035] Fig.15 is the structural view of embodiment in fig.12 of the rotatable iron of the present invention when a portion relative to the rotational handle device rotates along a first direction.

[0036] Fig.16 is the structural view of embodiment in fig.12 of the rotatable iron of the present invention when a portion relative to the rotational handle device is in the finishing position of the first direction rotation.

[0037] Fig.17 is the structural view of embodiment in fig.12 of the rotatable iron of the present invention when a portion relative to the rotational handle device rotates along a second direction.

[0038] Fig.18 is the top structural view in the embodiment of fig.12 of the rotatable iron of the present invention when the handle is in normal position.

[0039] Fig.19 is the top structural view in the embodiment of fig.12 of the rotatable iron of the present invention when the main body is sleeved with a brush cover and the handle rotates with 90°.

[0040] Fig.20 is the structural view of an embodiment of the garment steamer with rotatable iron of the present invention.

[0041] Fig.21 is the structural view of another embodiment of the garment steamer with rotatable iron of the

present invention.

Detailed description of the embodiments

[0042] Embodiment 1

[0043] The structure of an embodiment of rotatable iron of the present invention is showed as fig.8 and fig. 10. The main body 1 has an electric heater and is fixed with a housing 3, a box-shaped revolver, that is a revolving cover 2, is rotatably mounted on the main body 1. A position-limiting mechanism for restricting the rotational amplitude and a positioning mechanism for locking the relative position of the revolving cover 2 and the main body 1 are both disposed between the revolving cover 2 and the main body 1. The revolving cover 2 is fixed with the lower handle 4. An upper handle 6 is fixed on the lower handle 4, they form a complete handle. A flexible pipe 7 enters the inside of the handle from the rear ends of the upper handle 6 and lower handle 4, and then passes through the revolving cover 2 and the housing 3 to transport the steam to the main body 1 so the steam will be reheated and to be sprayed outside.

[0044] The main body 1, the revolving cover 2, the housing 3 and the lower handle 4 of the present invention form a rotational handle device. The exploded structure of the rotational handle device is showed in fig.1.

[0045] The main body 1 is an olive shape board the inside of which is installed with an electric heater. The upper surface of the main body 1 has two studs 11 for installing the housing 3. The center of the top surface of the main body 1 has a protruding cone-like substrate 12. The periphery of the top surface of the substrate 12 extends upward to form a circular upright wall 121 with a breach 123. The center of the top surface of the substrate 12 has a stud 124, two protruding blocks 122 are respectively disposed by the two sides of said stud 124. The top surfaces of the two protruding blocks 122 respectively have two corresponding retaining grooves 1221 for installing the spring tap 13. The substrate 12 has an air inlet 125 between the two protruding blocks 122 and the upright wall 121, the flexible pipe 7 is inserted in the air inlet 125 to transport the steam into the main body 1.

[0046] The spring tap 13 is U-shaped, its bottom is a projecting extension end 131; the roots of the two sides of its opening respectively extend outward to form two protruding points, a retaining groove 132 is formed between the two protruding points. Please refer to fig.5: a pressing plate 14 respectively presses the roots by the two sides of the opening of the spring tap 13 in the retaining grooves 1221 of the two protruding blocks 122 of the substrate 12, the tenons 141 of the two sides of said pressing plate 14 are respectively retained in the retaining grooves 132 correspond to the spring tap 13. A bolt 15 passes through a through hole 142 of the center of the pressing plate 14 and is locked tightly in the stud 124 of the top surface of the substrate 12, so the spring tap 13 will not move and the extension end 131 of the spring tap 13 is slightly higher than the upright wall 121 of the

substrate 12.

[0047] The revolving cover 2 is a shallow round box shape, the bottom of which is evenly distributed with three assembly holes 21 near its periphery; the center of the bottom has a circular inner hole 22; two retaining cavities 23 are disposed on the side wall of said inner hole 22. The included angle between the two retaining cavities 23 is 90°. The periphery of the top surface of the revolving cover 2 extends upward to form a circular upper flange 24. The bottom surface of the revolving cover 2 has a position-limiting block 25 extends downward, please refer to fig.6.

[0048] The housing 3 is an olive shape box with a open bottom, its external dimensions correspond to the main body 1. The top end surface of the housing 3 has two assembly holes 31 respectively correspond to the corresponding studs 11 of the main body 1. The center of the upper end surface of the housing 3 has a round opening 32; the periphery of said opening 32 rises upward to form a projecting boss 33. The top surface of the upper wall of said projecting boss 33 has a retaining ring 34, and has a circular groove 35 disposed on its bottom surface, please refer to fig.4.

[0049] The lower handle 4 has a bending portion 41 connected to the upper handle 6. The front end of the lower handle 4 has a round through hole 42. The periphery of said round through hole 42 is evenly distributed with three studs 43 extend upward and respectively correspond to the assembly holes 21 on the revolving cover 2. Please refer to fig.4, the bottom surface of the lower handle 4 has a circular groove 44 on the outer circumference of the round through hole 42.

[0050] The assembly relation of the rotational handle device of the present invention is showed in fig.1 and fig.4: the lower handle 4 is disposed above the housing 3 along the axis 5. The retaining ring 34 of the top surface of the upper end wall of the projecting boss 33 of the housing is retained in the circular groove 44 of the bottom surface of the lower handle 4. The revolving cover 2 is disposed beneath the opening 32 of the housing 3 along the axis 5. The upper flange 24 of the revolving cover 2 is retained in the circular groove 35 of the bottom surface of the upper end wall of the projecting boss 33 of the housing 3. The three bolts used as fastener respectively pass through the assembly holes 21 corresponds to the revolving cover 2 and then pass through the opening 32 of the housing 3 and locked on the stud 43 corresponds to the lower handle 4, the revolving cover 2 is fixed with the lower handle 4 along the axis 5 so they can freely rotate relative to the housing 3 along the axis 5.

[0051] After the housing 3 is installed with a lower handle 4 and revolving cover 2, it will cover the main body 1 along the axis 5. The two bolts respectively pass through the assembly holes 31 corresponds to the housing 3 and are locked and fixed on the stud 11 corresponds to the main body 1, so the housing 3 with a lower handle 4 and revolving cover 2 is fixed with the main body 1 as an integrity. Meanwhile the axis 5 of the revolving cover 2

is vertical to the bottom surface of the main body 1, further the axis 5 of the revolving cover 2 is located on the 1/2 of the lengthwise direction of the main body 1. In other embodiments, the axis 5 can be located on certain position from 1/3 to 1/2 of the lengthwise direction of the main body.

[0052] The upright wall 121 of the substrate 12 of main body 1 abuts against the bottom surface of the revolving cover 2, please refer to fig.4. Further refer to fig.6, the extension end 131 of the spring tap 13 is fixed on the main body 1 and retained in one of the two retaining cavities 23 on the side wall of the inner hole 22 of the revolving cover 2.

[0053] Please refer to fig.7, the position-limiting block 25 of the bottom surface of the revolving cover 2 stretches into the breach 123 of the main body 1 and can move in the breach 123. The breach 123 forms a curving groove on the upright wall 121 and corresponds to the movement path of the position-limiting block 25, while the position-limiting block 25 can only rotate with limits due to the restriction of said curving groove.

[0054] Fig.8 illustrates the perspective structure of the rotational handle device of the present embodiment when the lower handle 4 is in normal position. The transverse axis of the lower handle 4 is generally in accordance with the transverse axis of the main body 1 and the housing 3. The extension end 131 fixed on the spring tap 13 of the main body 1 is retained in the retaining cavity 23 by the right side of the side wall of the inner hole 22 of the revolving cover 2, so the lower handle 4 is locked in the position.

[0055] When the lower handle 4 rotates clockwise, the revolving cover 2 will be driven to rotate relative to the housing 3 and the main body 1. The position-limiting block 25 of the revolving cover 2 will turn to the left of the breach 123 from the right of the breach 123 of the substrate 12, please refer to fig.7. The rotational included angle of the position-limiting block 25 is restricted by the breach 123 to make the longitudinal axis of the lengthwise direction of the lower handle 4 be deflected from 0°~135° relative to the longitudinal axis of the lengthwise direction of the main body 1 and the housing 3. Meanwhile the extension end 131 of the spring tap 13 of the main body 1 exits from the retaining cavity 23 by the right of the side wall of the inner hole 22 of the revolving cover 2 and then slides toward the left retaining cavity 23. When the retaining cavity 23 by the left of the revolving cover 2 rotates to the extension end 131 of the spring tap 13, as showed in fig.9, the longitudinal axis of the lower handle 4 will be deflected with 90° relative to the longitudinal axis of the main body 1 and the housing 3. The extension end 131 of the spring tap 13 is retained in the left retaining cavity 23 of the revolving cover 2, the lower handle 4 will be re-fixed at a angle after rotation, so the rotational positioning with 90° is realized.

[0056] Obviously, if the side wall of the inner hole 22 of the revolving cover 2 are disposed with a plurality of retaining cavities 23, the lower handle 4 will be positioned

in many angle points within the rotational range determined by the breach 123 and the position-limiting block 25.

[0057] Besides, the rotational mechanism between the revolving cover 2 and the main body 1 can also be designed as: the housing has a circular flange disposed on the bottom surface of the opening, the top surface of the revolving cover has a circular groove which cooperates with said circular flange.

[0058] The position-limiting mechanism between the revolving cover 2 and the main body 1 can also be designed as: the position-limiting block is disposed on the main body, the curving groove is disposed on the bottom surface of the revolving cover.

[0059] When the included angle between the longitudinal axis of the handle composed by the lower handle 4 and the upper handle 6 and the longitudinal axis of the main body 1 is 0° or 90°, the relative position of the handle and the main body 1 is locked, at this time the iron of the present embodiment can be used as steam iron, please refer to fig.10.

[0060] The iron of the present embodiment is used as steam brush, as showed in fig.11: after the main body 1 of the present embodiment is sleeved with a brush cover 8, the brush of the brush cover 8 will depart from the paper, and the projecting lugs by the two sides of the brush cover 8 will be retained in the waist of the main body 1. At this time, the handle is permitted to rotate relative to the main body 1, the included angle between the longitudinal axis of the handle and the longitudinal axis of the main body 1 can be fixed at an optional position between 0° ~ 135°. By transporting the steam to the main body 1 with the flexible pipe 7, the main body 1 will reheat the steam and spray it out, thereby the clothes will be ironed smooth by the cooperation of the steam and the brush of the brush cover 8.

[0061] Embodiment 2

[0062] Another embodiment of rotatable iron of the present invention is showed as fig.12 and fig.13. Said iron comprises: a housing 100, a main body 180, a lower handle 200, a handle main body 300, an upper handle 400, a key 500, a guiding canister 600, a rotational shaft 700, a flexible pipe 800 and a revolving cover 900 and so on.

[0063] The main body 1 is an olive shape board the inside of which is installed with an electric heater. The top surface of the main body 180 extends upward to form a projecting boss 181, the center of said projecting boss 181 has an air inlet communicates with the inside of the main body 180.

[0064] The housing 100 is an olive shape box with a open bottom, its external dimensions correspond to the main body 1. The center of top end surface of the housing 100 has a round flat plate 110 the center of which has a guiding hole 120 with a pair of sliding key grooves, and two circular arc openings 130 are opened on the outer periphery of said guiding hole 120. The periphery of the flat plate 110 rises upward to form a projecting boss 140.

The top surface of the upper wall of said projecting boss 140 has a retaining ring 150 and a circular groove 160 disposed on the bottom surface of the upper wall of the projecting boss 140.

[0065] The lower handle 200, the handle main body 300 and the upper handle 400 compose a handle with an open center. The handle main body 300 is a trapezoidal thin shell with an open center, its front and rear ends are pipe shape, the upper and lower side walls are tile shape, a through groove 310 is disposed on its upper side wall. The front end of the handle main body 300 has a canister 320 for assembly. The middle and rear parts of the lower handle 200 are tile-shaped thin shells and respectively connected to the corresponding middle and rear parts of the lower side wall of the handle main body 300. The front end of the lower handle 200 is a boat tail shape and is connected to the corresponding front end of the handle main body 300 and the corresponding front part of the lower side wall. The bottom surface of the front end of the lower handle 200 has a round through hole, two studs 210 extend downward are disposed oppositely by the periphery of said round through hole. The bottom surface of the lower handle 200 has a circular groove 220 on the outer periphery of the round through hole. The upper handle 400 is a tile-shaped thin shell corresponds to the front end of handle main body 300 and the upper side wall, and connected to the corresponding front end of handle main body 300 and the upper side wall. The middle part of the upper handle 400 has a pair of projecting lugs 410 extend downward, a cross shaft 400 passes through the shaft holes of the pair of projecting lugs 410 for connecting the key 500 to the upper handle 400. The front end of the upper handle 400 has a pair of upright pillars extend downward, the inner surfaces of the lower parts of each pillar respectively has a position-limiting block 430. A screwed pipe 440 extend downward is disposed between the two upright pillars of the front end of the upper handle 400. The upfront end of the upper handle 400 has a canister 450 extends downward for assembly.

[0066] The middle part of the key 500 has a transverse shaft hole 510. The front end of the key 500 has a longitudinal groove 520, so the front end of the key 500 has two branches, the bottom surface of each branch has a protruding point 530.

[0067] The lower part of the outer circumferential surface of the guiding canister 600 has a pair of opposite curving grooves. A pair of sliding keys 610 is formed between the pair of curving grooves. The upper part of the outer circumferential surface of the guiding canister 600 has a pair of opposite trapezoidal revolving guiding grooves 620; the two parallel sides of each trapezoidal revolving guiding groove 620 are parallel to the axis of the guiding canister 600, the lowest point of the upper sloping side has a protrude positioning point 621. The upper end surface of the guiding canister 600 has two units of opposite V-shaped grooves 630 along the periphery, each unit of V-shaped groove 630 comprises two

V-shaped grooves disposed continuously along the periphery.

[0068] The rotational shaft 700 is an inverted T-shaped pipe, the upper part of its small end has an external thread. The rotational shaft 700 is sleeved with a spring 710.

[0069] The front part of the lower handle 200 is stacked above the housing 100, the two studs 210 of the lower handle 200 respectively passes through the openings 130 correspond to the flat plate 110 of the housing 100 and extends into the housing 100. The retaining ring 150 of the top surface of the upper end wall of the projecting boss 140 of the housing 100 is retained in the circular groove 220 of the bottom surface of the lower handle 200. The revolving cover 900 is disposed beneath the flat plate 110 of the housing 100. The upper flange 910 of the revolving cover 900 is retained in the circular groove 160 of the bottom surface of the upper end wall of the projecting boss 140 of the housing 100. The two studs 210 respectively passes through the assembly holes 920 of the revolving cover 900 from below and are locked on the studs 210 corresponds to the lower handle 200, so the revolving cover 900 are fixed with the lower handle 200 along the same axis while the revolving cover 900 and the lower handle 200 can also freely rotate relative to the housing 100 along the same axis.

[0070] The rotational shaft 700 and the spring 710 are sleeved in the guiding canister 600, the external thread of the upper part of the rotational shaft 700 extends out of the bottom of the guiding canister 600, and screwed joint with the screw pipe 440 of the upper handle 400. The spring 710 pushes against the guiding canister 600 upward, so the two units of V-shaped grooves 630 of the upper end surface of the guiding canister 600 respectively contact with the protruding points 530 corresponds to the front end of the key 500. The two position-limiting blocks 430 of the front end of the upper handle 400 respectively retained in the trapezoidal revolving guiding groove 620 corresponds to the guiding canister 600.

[0071] The front end of the flexible pipe 800 is inserted and locked in the air inlet of the center of the projecting boss 181 of the main body 180. The rear end of the flexible pipe 800 passes through the central hole of the bottom of the revolving cover 900, the guiding hole 120 of the flat plate 110 of the housing 100, the round through hole of the front end of the lower handle 200, the front part of the handle main body 300, the central hole of rotational shaft 700 and the longitudinal groove 520 of the front end of the key 500, and be led into a pipe between the upper side of the handle main body 300 and the upper handle 400 with the through hole of the bottom of the screw pipe 440 of the upper handle 400, and then be led out of the rear part of the handle.

[0072] The housing 100 installed with a lower handle 200 and revolving cover 900 covers the main body 180 along the same axis. The housing 100 are fixed with the main body 180 as integrity with bolt. The axis of the revolving cover 900 is vertical to the bottom surface of the

main body 180 and is located on the 1/2 of the lengthwise direction of the main body 180. In other embodiments, the axis of the revolving cover 900 can be located from 1/3 to 1/2 of the lengthwise direction of the main body 180.

[0073] The lower part of the guiding canister 600 is inserted in the guiding hole 120 of the center of the flat plate 110 of the housing 100, a pair of sliding keys 610 of the guiding canister 600 are respectively retained in the sliding key grooves correspond to the guiding hole 120, so the guiding canister 600, the housing 100 and the main body 180 can rotate synchronously, further the guiding canister 600 can move upward and downward relative to the housing 100 and the main body 180.

[0074] The canister 450 of the upper handle 400 is inserted into the canister 320 of the front end of the handle main body 300, a bolt passes through the canister 450 of upper handle 400 and the canister 320 of the handle main body 300 and is locked in the stud 230 of the front end of the lower handle 200. The handle main body 300 utilizes the stud, the lower handle 200 and an assembly hole corresponds to the upper handle 400 to cooperate with the bolt, so the lower handle 200, the handle main body 300 and the upper handle 400 are connected as integrity.

[0075] In the present invention, the movement path of the two position-limiting blocks 430 of the front end of the upper handle 400 between two sloping sides of said trapezoidal revolving guiding groove 620 are respectively correspond to the amplitude of a first and second rotational direction of the guiding canister 600 relative to the handle.

[0076] The structure of a portion relative to the rotational handle device of the present embodiment wherein the portion is at an original position, as showed in fig. 14: the two protruding points 530 of the front end of the key 500 respectively abuts against the declining surface of the first V-shaped groove of the unit of V-shaped groove corresponds to the guiding canister 600. The two position-limiting blocks 430 of the front end of the upper handle 400 respectively locate on the lowest points corresponds to the long straight side of the trapezoidal revolving guiding groove 620. The axis of the lengthwise direction of the upper handle 400 is parallel to the axis of the lengthwise direction of the housing 100.

[0077] Exerts a pressure to the rear half part of the key 500, the two protruding points 530 of the front end of the key 500 respectively press downward a declining surface of a first V-shaped groove of the unit of V-shaped groove 630 corresponds to the guiding canister 600, so the guiding canister 600 will parallel move relative to the housing 100, the spring 710 in the guiding canister 600 will be compressed. The two position-limiting blocks 430 of the front end of the upper handle 400 respectively raise to the top point along the long straight side of the trapezoidal revolving guiding groove 620 corresponds to the guiding canister 600; then the two protruding points 530 of the front end of the key 500 respectively move sideways and downward to the lowest point of the first V-shaped groove

along the declining surface of the first V-shaped groove of the unit of V-shaped groove 630 corresponds to the guiding canister 600, the guiding canister 600 will rotate with a small angle. The axis of the lengthwise direction of the upper handle 400 forms a small included angle with the axis of the lengthwise direction of the housing 100, please refer to fig. 15.

[0078] Releases the key 500, the rebound force of the spring 710 will push against the guiding canister 600 upward; the two position-limiting blocks 430 of the front end of the upper handle 400 respectively move sideways and downward along the upper sloping side of the trapezoidal revolving guiding groove 620 corresponds to the guiding canister 600, then the guiding canister 600 will rotate with a large amplitude. The two protruding points 530 of the front end of the key 500 respectively move sideways and upward along the ascending surface of the first V-shaped groove of the unit of V-shaped groove corresponds to the guiding canister 600. The two position-limiting blocks 430 respectively move to the lowest point of the upper sloping side of the trapezoidal revolving guiding groove 620 corresponds to the guiding canister 600 and are stopped by the protrude positioning point 621, then the spring 710 will not stretch. The guiding canister 600 rotates along a first direction with a predetermined angle, which is 90° . The axis of the lengthwise direction of the upper handle 400 is vertical to the axis of the lengthwise direction of the housing 100, please refer to fig. 16. Meanwhile, the two protruding points 530 of the front end of the key 500 have respectively passed the ascending surface of the first V-shaped groove of the unit of V-shaped groove corresponds to the guiding canister 600 and then entered the declining surface of the second V-shaped groove.

[0079] Exerts a pressure to the rear half part of the key 500 once again, the two protruding points 530 of the front end of the key 500 respectively downward press the declining surface of the second V-shaped groove of the unit of V-shaped groove corresponds to the guiding canister 600, so the guiding canister 600 will parallel move downward, the spring 710 in the guiding canister 600 will be compressed. The two position-limiting blocks 430 of the front end of the upper handle 400 respectively pass the protrude positioning point 621 of the upper sloping side of the trapezoidal revolving guiding groove 620 corresponds to the guiding canister 600; then the guiding canister 600 will rotate with a small amplitude, the included angle between the axis of the lengthwise direction of the upper handle 400 and the axis of the lengthwise direction of the housing 100 is slightly more than 90° . Then the two protruding points 530 will respectively move sideways and downward along the declining surface of the second V-shaped groove of the unit of V-shaped groove corresponds to the guiding canister 600. The two position-limiting blocks 430 will be stopped after arriving at the upper end of the short straight side of the trapezoidal revolving guiding groove 620 corresponds to the guiding canister 600, please refer to fig. 17.

[0080] Releases the key 500, the rebound force of the spring 710 will upward push against the guiding canister 600. The two position-limiting blocks 430 of the front end of the upper handle 400 respectively move downward along the short straight side of the trapezoidal revolving guiding groove 620 corresponds to the guiding canister 600. The spring 710 will continuously push against the guiding canister 600 upward, the two position-limiting blocks 430 will reversely and respectively move to the lowest point along the lower sloping side of the trapezoidal revolving guiding groove 620 corresponds to the guiding canister 600, the guiding canister 600 will rotate along a second direction. The two protruding points 530 of the front end of the key 500 respectively move sideways and upward along the declining surface of the second V-shaped groove of the unit of V-shaped groove corresponds to the guiding canister 600 and then passes the declining surface of the second V-shaped groove to enter the ascending surface of the first V-shaped groove. The two position-limiting blocks 430 respectively move to the lowest point along the lower sloping side of the trapezoidal revolving guiding groove 620 corresponds to the guiding canister 600 and be stopped by the long straight side, the spring 710 will not stretch. The guiding canister 600 will rotate along a second direction with 90° and back to its original position, please refer to fig. 14. The axis of the lengthwise direction of the upper handle 400 is parallel to the axis of the lengthwise direction of the housing 100. Meanwhile the two protruding points 530 of the front end of the key 500 have arrived at the upper part of the declining surface of the first V-shaped groove of the unit of V-shaped groove corresponds to the guiding canister 600, thus the next rotation cycle is prepared.

[0081] When the included angle between the longitudinal axis of the handle and the longitudinal axis of the housing 100 and the main body 180 is 0° or 90° , the relative position of the handle, the housing 100 and the main body 180 is locked, so the iron of the present embodiment can be used as steam iron, please refer to fig. 18.

[0082] The iron of the present embodiment can be used as steam brush, as showed in fig. 19: after the main body 180 of the present embodiment is sleeved with a brush cover 190, the brush of the brush cover 190 will depart from the paper, and the projecting lugs by the two sides of the brush cover 190 will be retained in the waist of the main body 180. At this time, the handle is permitted to rotate relative to the main body 180, the included angle between the longitudinal axis of the handle and the longitudinal axis of the housing 100 and the main body 180 can be fixed at a position of $0^\circ \sim 90^\circ$. By transmitting the steam to the main body 180 with the flexible pipe 800, the main body 180 will reheat the steam and spray it outside, thereby the clothes will be ironed smooth by the cooperation of the steam and the brush of the brush cover 190.

[0083] Embodiment 3

[0084] The structure of garment steamer with rotatable iron of an embodiment of the present invention is showed in fig.20. Its boiler 1000 comprises a water tank 1001 and a heater 1002 and transports the steam to the iron described in embodiment 1 with a pipeline 1003; the boiler 1000 has a rack 1004 for supporting said iron or detachable said iron from rack 1004, a hook 1005 is disposed on the upper end of the rack 1004 for detachably supporting said iron.

[0085] The structure of said iron has been described detailed in the embodiment 1, so the structure of said iron will be described briefly for saving space.

[0086] A rotatable iron, its main body 1 has an electrical heater and is mounted with a housing 3. The lower handle 4 is fixed with an upper handle 6 to form a complete handle. A revolver, that is a box-shaped revolving cover 2, is rotatably connected to the main body 1 and the lower handle 4 which can rotate relative to the main body 1. A position-limiting mechanism for restricting the rotational amplitude and a resilient positioning mechanism for locking the position of rotational angle are both disposed between the main body 1 and the lower handle 4.

[0087] Said housing has an opening 32 corresponds to the revolving cover 2 installed under the housing 3, and the lower handle 4 above the revolving cover 2 and the housing 3 passes through said opening 32 with a fastener for fixed connection; the housing 3 has a circular groove on the bottom surface of the opening 32 to cooperate with a circular flange of the top surface of the lower handle 4; the housing 3 has a circular groove on the top surface of outside of the opening 32 to cooperate with a circular flange of the bottom surface of the lower handle 4, thus forms a coaxial rotational connection between the lower handle 4 and the housing 3 and between the revolving cover 2 and the housing 3.

[0088] Said resilient positioning mechanism comprises at least two retaining cavities 23 disposed on the wall of the inner hole of the revolving cover 2 and a spring tap 13 fixed on the main body 1, said spring tap 13 has an extension end retained in one of said optional retaining cavities 23.

[0089] Said position-limiting mechanism comprises a curving groove 123 disposed on the main body 1, and a position-limiting block 25 disposed on the bottom surface of the revolving cover 2 and extends into said curving groove 123, the movement path of the curving groove 123 corresponds to the movement path of said position-limiting block 25.

[0090] A flexible pipe 7 communicates with the pipeline 1004 and the air inlet 125 of the main body 1; said main body 1 is detachably sleeved with a brush cover 8. When the relative position of the lower handle 4 and the main body 1 is locked, said iron can be used as steam iron; after the main body 1 is sleeved with a brush cover, said iron can be used as steam brush.

[0091] Embodiment 4

[0092] The structure of garment steamer with rotatable iron of another embodiment of the present invention is

showed in fig.21. Its boiler 1000 comprises a water tank 1001 and a heater 1002 and transports the steam to the iron described in embodiment 1 with a pipeline 1003; the boiler 1000 has a rack 1004, a hook 1005 is disposed on the upper end of the rack 1004 for supporting said iron or detachable said iron from rack 1004.

[0093] The structure of said iron has been described detailed in the embodiment 1, so the structure of said iron will be described briefly for reason of saving space.

[0094] The main body 180 of iron has an electrical heater and is mounted with a housing 100. The lower handle 200, the handle main body 300 and the upper handle 400 forms a handle with an open middle part. A revolver, that is a box-shaped revolving cover 900, is rotatably connected to the housing 100 and the lower handle 200 which can rotate relative to the housing 100. A position-limiting mechanism for restricting the rotational amplitude and a resilient positioning mechanism for locking the position of rotational angle are both disposed between the main body 100 and the upper handle 400.

[0095] The housing 100 has an curving opening 130 on a connection rod corresponds to the revolving cover 900 and the lower handle; the revolving cover 900 is mounted beneath the housing 100, further the revolving cover 900 is fixed with the lower handle 200 above the housing 100 with a fastener passing through said opening 130. The housing 100 has a circular groove on the bottom surface of the outside of the opening 130 to cooperate with a circular flange on the top surface of the revolving cover 900; the housing 100 has a circular groove on the top surface of the outside of the opening 130 to cooperate with a circular flange on the bottom surface of the lower handle 200, thus forms a coaxial rotational connection between the lower handle 200 and the housing 100 and between the revolving cover 900 and the housing 100.

[0096] The position-limiting mechanism comprises a trapezoidal revolving guiding groove 620 disposed on the outer circumferential surface of a guiding canister 600 and a position-limiting block 430 disposed on the upper handle 400 and extends into said trapezoidal revolving guiding groove 620. Said guiding canister 600 is installed on the upper handle 400 with a rotational shaft 700, the two parallel sides of said trapezoidal revolving guiding groove 620 are parallel to the axis of the guiding canister 600, the movement path of said position-limiting block 430 between two sloping sides of said trapezoidal revolving guiding groove 620 are respectively correspond to the amplitude of a first and second rotational direction of the guiding canister relative to the upper handle 400.

[0097] The resilient positioning mechanism comprises a spring 710 disposed on the rotational shaft 700 of the guiding canister 600 and upward biased against the guiding canister 600, a protrude positioning point 621 disposed on the lowest point of the upper sloping side of the trapezoidal revolving guiding groove 620 for stopping the position-limiting block 430 of the upper handle 400,

a sliding key 610 disposed on the lower part of the outer circumferential surface of the guiding canister 600 and a guiding hole 120 disposed on the housing 100 for receiving the guiding canister 600 and its sliding key 610. The sliding key 610 on the guiding canister 600 cooperates with a sliding key groove of a guiding hole 120 on the housing 100, so the connection between the guiding canister 600 and the main body can make them parallel move to each other and rotate together. The spring 710 pushes against the guiding canister 600 to make the position-limiting block 430 of the upper handle 400 retained in the lowest point of the lower sloping side of the trapezoidal revolving guiding groove 620 or in the protrude positioning point of the lowest point of the upper sloping side.

[0098] The upper end surface of said guiding canister 600 has at least two V-shaped grooves 630 continuously extend along its periphery, a lever-type key 500 is disposed on the upper handle 400, the front end of said lever-type key 500 abuts against one of said optional V-shaped grooves of the guiding canister 600.

[0099] A flexible pipe 800 communicates with a pipeline 1004 and an air inlet 181 of the main body 180; said main body 180 is detachably sleeved with a brush cover 190. When the relative position of the lower handle 200 and the main body 180 is locked, said iron can be used as steam iron; after the main body 180 is sleeved with a brush cover 190, said iron can be used as steam brush.

Industrial applicability

[0100] The present invention is provided with a rotatable iron, the handle of which can rotate relative to the main body in a limited amplitude with the position-limiting mechanism. The iron can be utilized more flexibly, the part of clothes which is difficult to be ironed will now be easily ironed, and the ironing quality is higher. The garment steamer with rotatable iron of the present invention utilizes above rotatable iron, the ironing width can be adjusted by changing the angle between the lengthwise direction of the main body and the lengthwise direction of the handle; it can not only be used as a steam brush, but also be used as an iron. Thereby said garment steamer has advantages such as multiple using manners and higher functionality.

Claims

1. A rotatable iron comprising a main body having an electrical heater, said main body is mounted with a housing, wherein a revolver is rotatably connected to the main body and a handle, a position-limiting mechanism for restricting the rotational amplitude and a resilient positioning mechanism for locking the position of rotational angle are both disposed between the main body and the handle.
2. The rotatable iron according to claim 1, wherein said

revolver is a box-shaped revolving cover; said housing has an opening corresponds to the revolving cover installed under the housing; and the handle above the revolving cover and the housing passes through said opening with a fastener for connection; the housing has a circular groove on the bottom surface of the opening to cooperate with a circular flange of the top surface of the revolving cover; the housing has a circular groove on the top surface of the opening to cooperate with a circular flange of the bottom surface of the handle to form a coaxial rotational connection between the handle and the housing and between the revolving cover and the housing.

3. The rotatable iron according to claim 2, wherein the axis of said revolving cover is vertical to the bottom surface of the main body and is located from 1/3 to 1/2 of the lengthwise direction of the main body.
4. The rotatable iron according to claim 2 or claim 3, wherein said resilient positioning mechanism comprises at least two retaining cavities disposed on the wall of an inner hole of the revolving cover and a spring tap fixed on the main body, said spring tap has an extension end retained in one of said optional retaining cavities.
5. The rotatable iron according to claims 2 or 3, wherein said position-limiting mechanism comprises a curving groove disposed on the main body, and a position-limiting block disposed on the bottom surface of the revolving cover and extends into said curving groove, the movement path of the curving groove corresponds to the movement path of said position-limiting block.
6. The rotatable iron according to claims 2 or 3, wherein said position-limiting mechanism comprises a trapezoidal revolving guiding groove disposed on the outer circumferential surface of a guiding canister and a position-limiting block disposed on the handle and extends into said trapezoidal revolving guiding groove; said guiding canister is installed on the handle with a rotational shaft, the two parallel sides of said trapezoidal revolving guiding groove are parallel to the axis of the guiding canister, the movement path of said position-limiting block between two sloping sides of said trapezoidal revolving guiding groove are respectively correspond to the amplitude of a first and second rotational direction of the guiding canister relative to the handle.
7. The rotatable iron according to claim 6, wherein said resilient positioning mechanism comprises a spring disposed on the rotational shaft of the guiding canister and upward biased against the guiding canister, a protrude positioning point disposed on the lowest point of the upper sloping side of the trapezoidal re-

- volving guiding groove for stopping the position-limiting block of the handle, a sliding key disposed on the lower part of the outer circumferential surface of the guiding canister and a guiding hole disposed on the housing for receiving the guiding canister and its sliding key; the sliding key on the guiding canister cooperates with a sliding key groove of a guiding hole on the housing, so the connection between the guiding canister the main body can make them parallelly move to each other and rotate together; said spring biases against the guiding canister to make the position-limiting block retained in the lowest point of the lower sloping side of the trapezoidal revolving guiding groove or in the protrude positioning point of the lowest point of the upper sloping side.
8. The rotatable iron according to claim 7, wherein the upper end surface of said guiding canister has at least two V-shaped grooves continuously extend along its periphery, a lever-type key is disposed on the handle, the front end of said lever-type key abuts against one of said optional V-shaped grooves.
 9. A garment steamer with a rotatable iron, the boiler of which including a water tank and a heater transports the steam to the iron with a pipeline; the boiler has a rack for supporting said iron or detachable said iron from rack ; wherein a main body of said iron has an electrical heater and is mounted with a housing, a revolver is rotatably connected the main body and the handle, a position-limiting mechanism for restricting the rotational amplitude and a resilient positioning mechanism for locking the position of the rotational angle are both disposed between the main body and the handle; a flexible pipe communicates with the pipeline and an air inlet of the main body; said main body is detachably sleeved with a brush cover.
 10. The garment steamer with a rotatable iron according to claim 9, wherein said revolver is a box-shaped revolving cover; the housing has an opening corresponds to the revolving cover which is mounted under the housing, and the handle above the revolving cover and the housing passes through said opening with a fastener for connection; the housing has a circular groove on the bottom surface of the opening to cooperate with a circular flange on the top surface of the revolving cover; the housing has a circular groove on the top surface of the opening to cooperate with a circular flange on the bottom surface of the handle, thus forms a coaxial rotational connection between the handle and the housing and between the revolving cover and the housing.
 11. The garment steamer with a rotatable iron according to claim 10, wherein said resilient positioning mechanism comprises at least two retaining cavities disposed on the wall of the inner hole of the revolving cover and a spring tap fixed on the main body, said spring tap has an extension end retained in one of said optional retaining cavities.
 12. The garment steamer with a rotatable iron according to claim 10, wherein said position-limiting mechanism comprises a curving groove disposed on the main body, and a position-limiting block disposed on the bottom surface of the revolving cover and extends into said curving groove, the movement path of the curving groove corresponds to the movement path of said position-limiting block.
 13. The garment steamer with a rotatable iron according to claim 10, wherein said position-limiting mechanism comprises a trapezoidal revolving guiding groove disposed on the outer circumferential surface of a guiding canister, and a position-limiting block disposed on the handle and extends into said trapezoidal revolving guiding groove; said guiding canister is installed on the handle with a rotational shaft, the two parallel sides of said trapezoidal revolving guiding groove are parallel to the axis of the guiding canister, the movement path of said position-limiting block between two sloping sides of said trapezoidal revolving guiding groove are respectively correspond to the amplitude of a first and second rotational direction of the guiding canister relative to the handle.
 14. The garment steamer with a rotatable iron according to claim 13, wherein said resilient positioning mechanism comprises a spring disposed on the rotational shaft of the guiding canister and upward biased against the guiding canister, a protrude positioning point disposed on the lowest point of the upper sloping side of the trapezoidal revolving guiding groove for stopping the position-limiting block of the handle, a sliding key disposed on the lower part of the outer circumferential surface of the guiding canister and a guiding hole disposed on the housing for receiving the guiding canister and its sliding key; the sliding key on the guiding canister cooperates with a sliding key groove of a guiding hole on the housing, so the connection between the guiding canister the main body can make them parallelly move to each other and rotate together; said spring biases against the guiding canister to make the position-limiting block retained in the lowest point of the lower sloping side of the trapezoidal revolving guiding groove or in the protrude positioning point of the lowest point of the upper sloping side.
 15. The garment steamer with a rotatable iron according to claim 14, wherein the upper end surface of said guiding canister has at least two V-shaped grooves continuously extend along its periphery, a lever-type

key is disposed on the handle, the front end of said lever-type key abuts against one of said optional V-shaped grooves.

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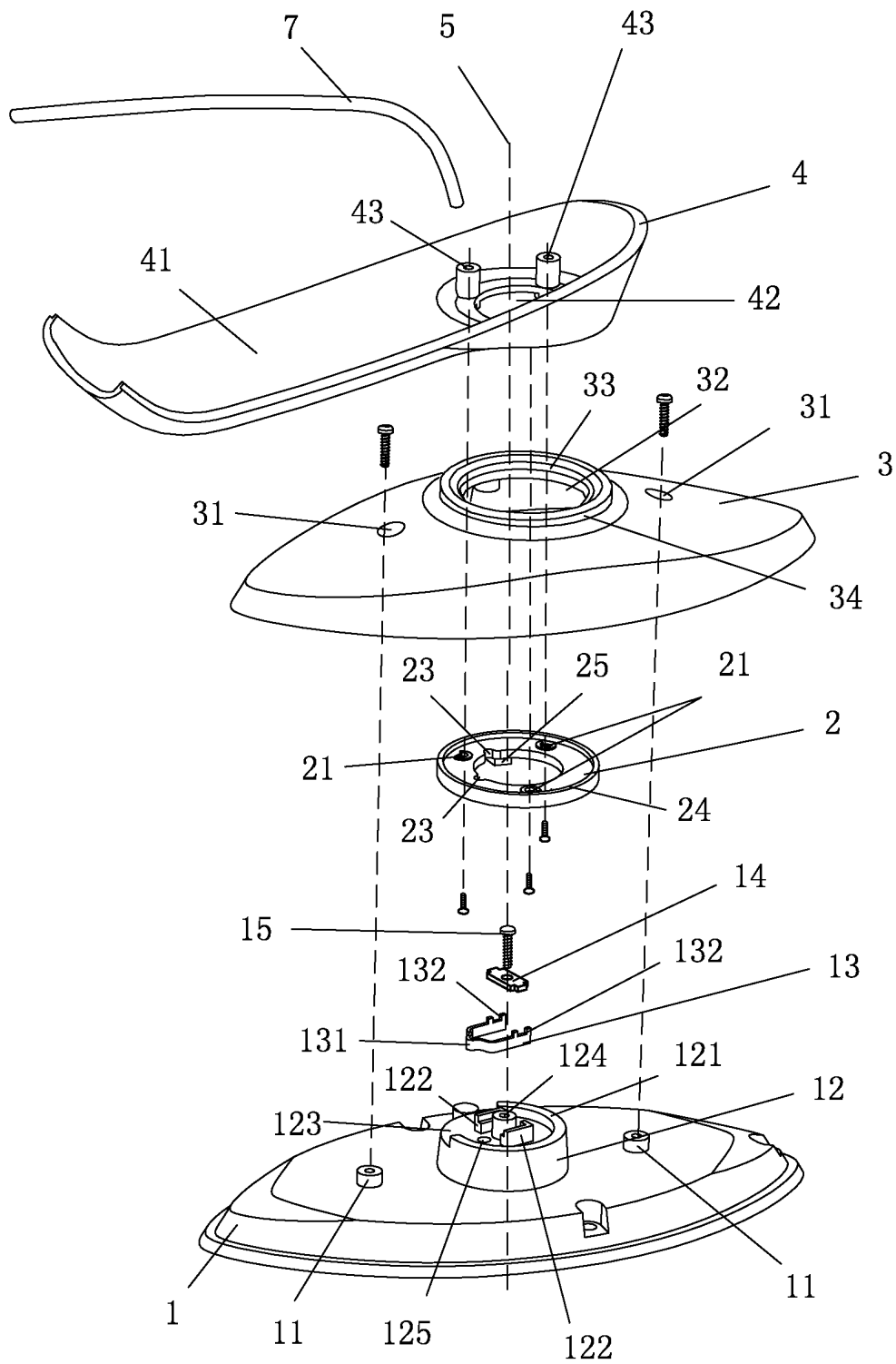


FIG. 1

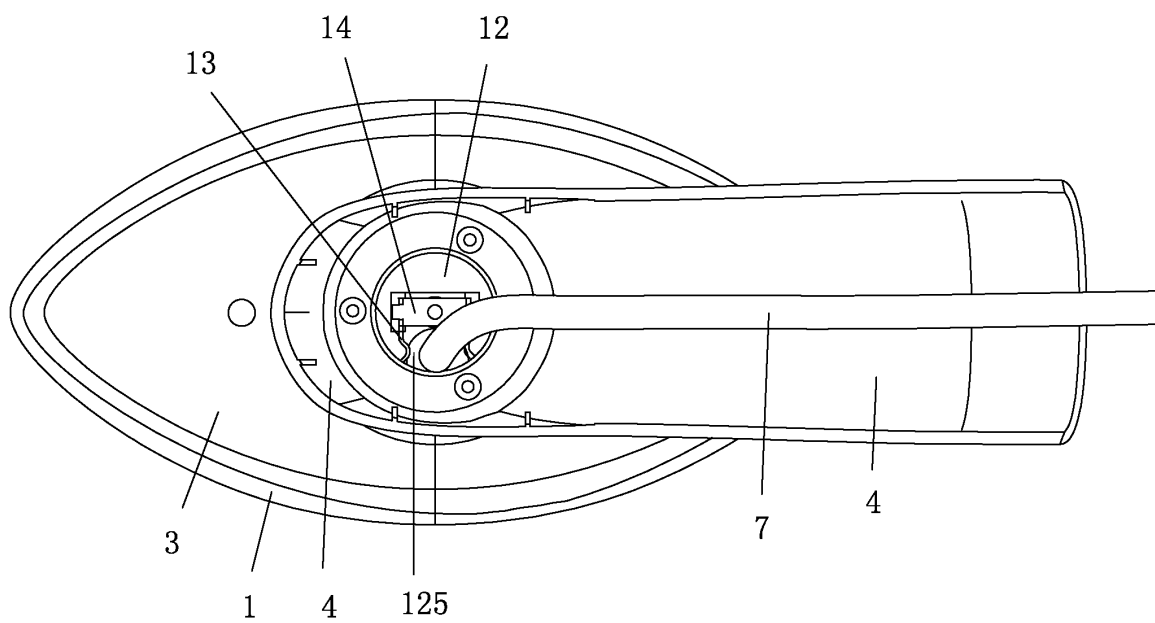


FIG. 2

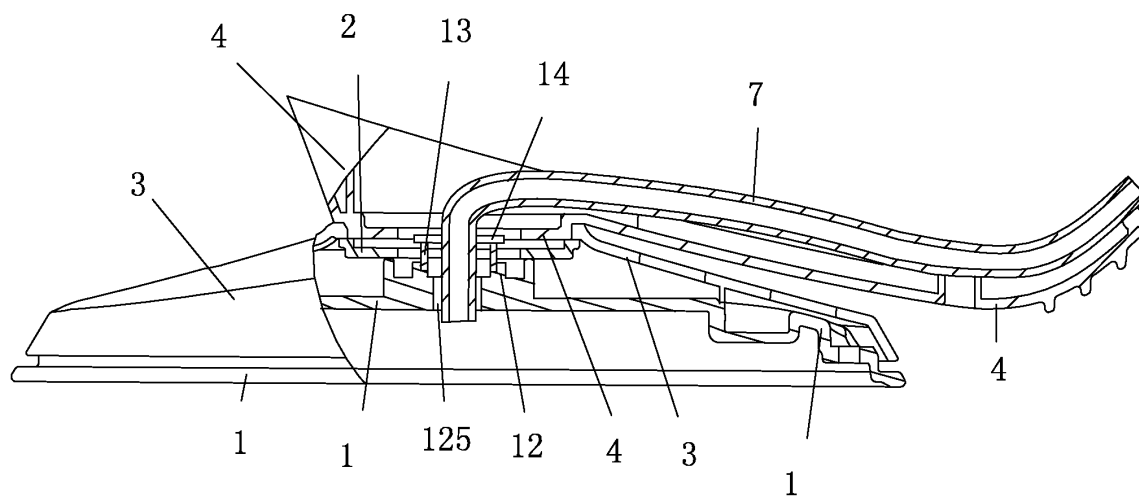


FIG. 3

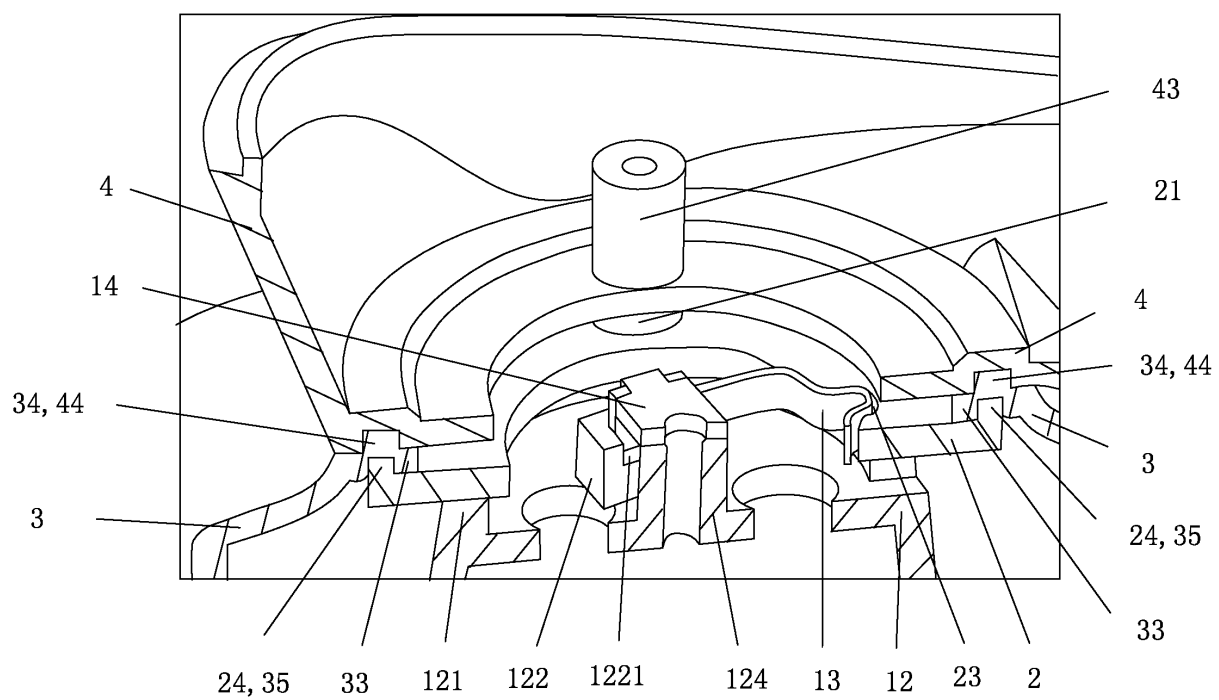


FIG. 4

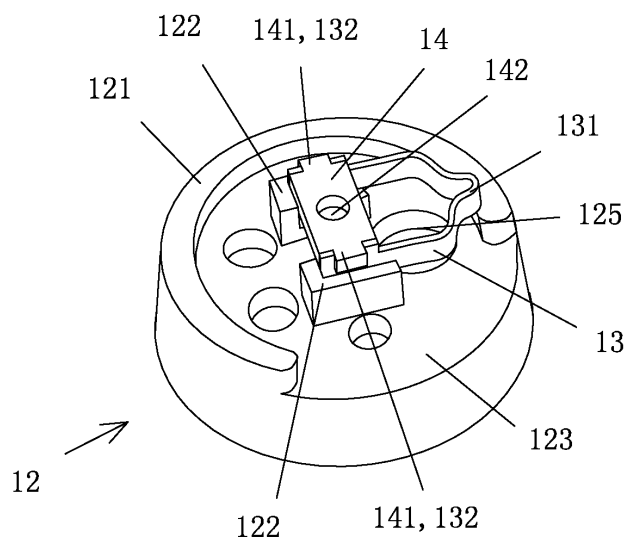


FIG. 5

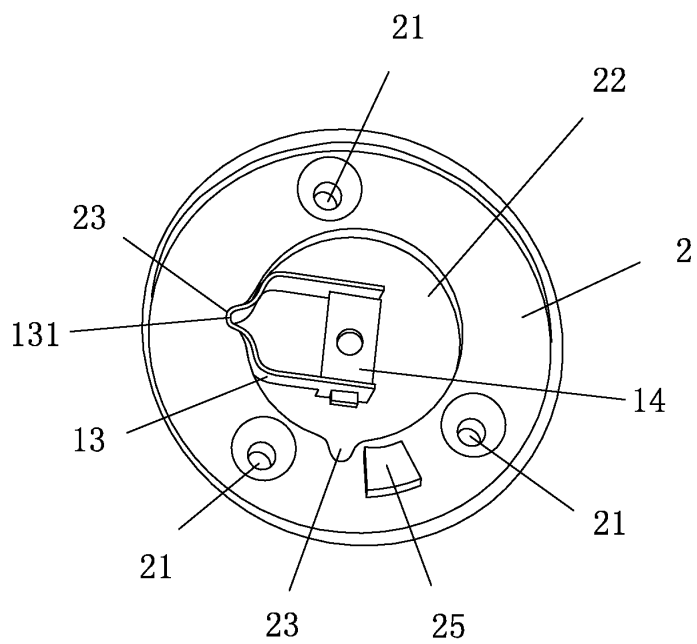


FIG. 6

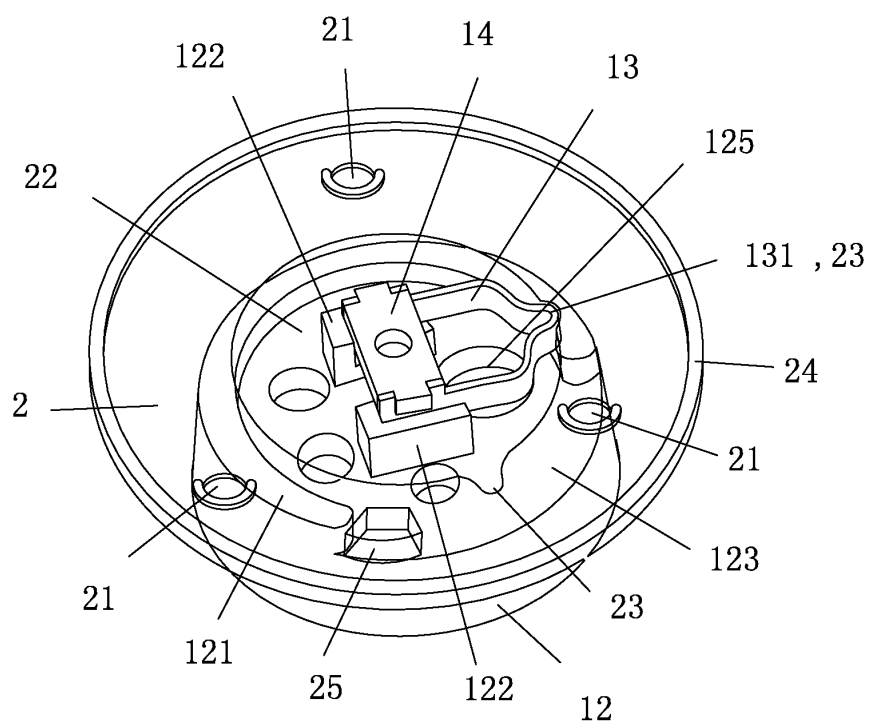


FIG. 7

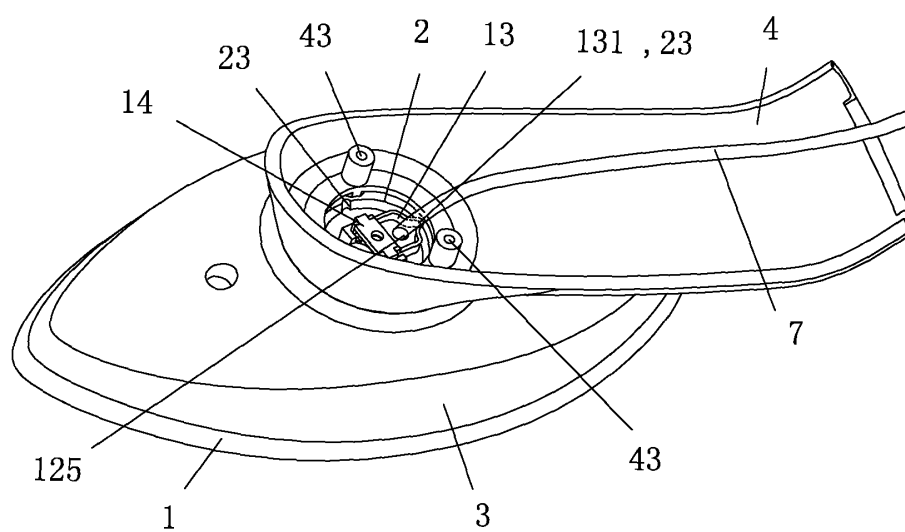


FIG. 8

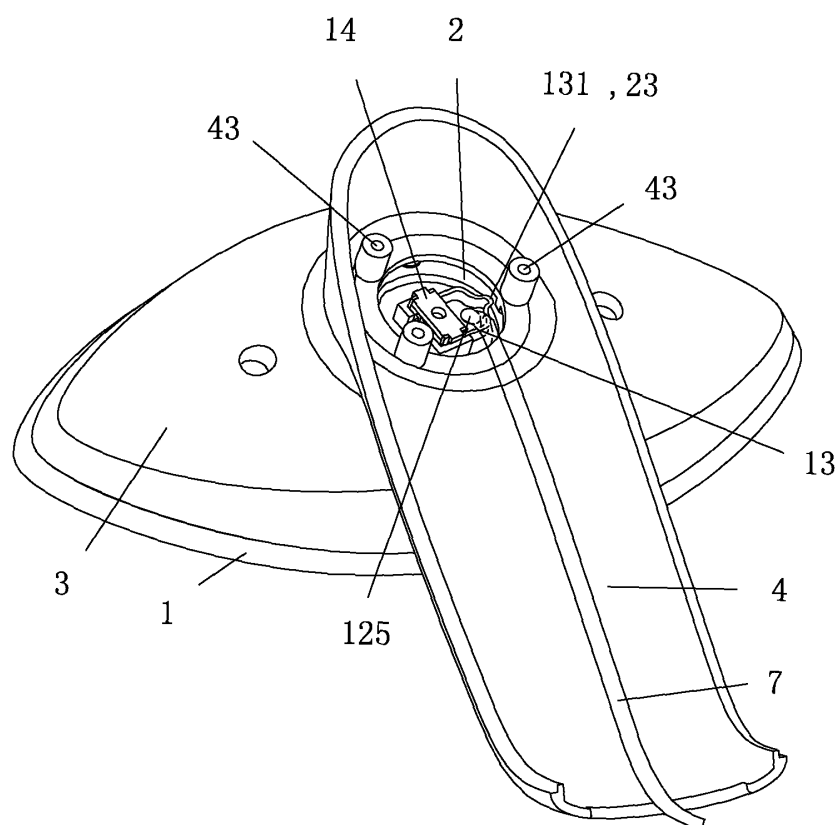


FIG. 9

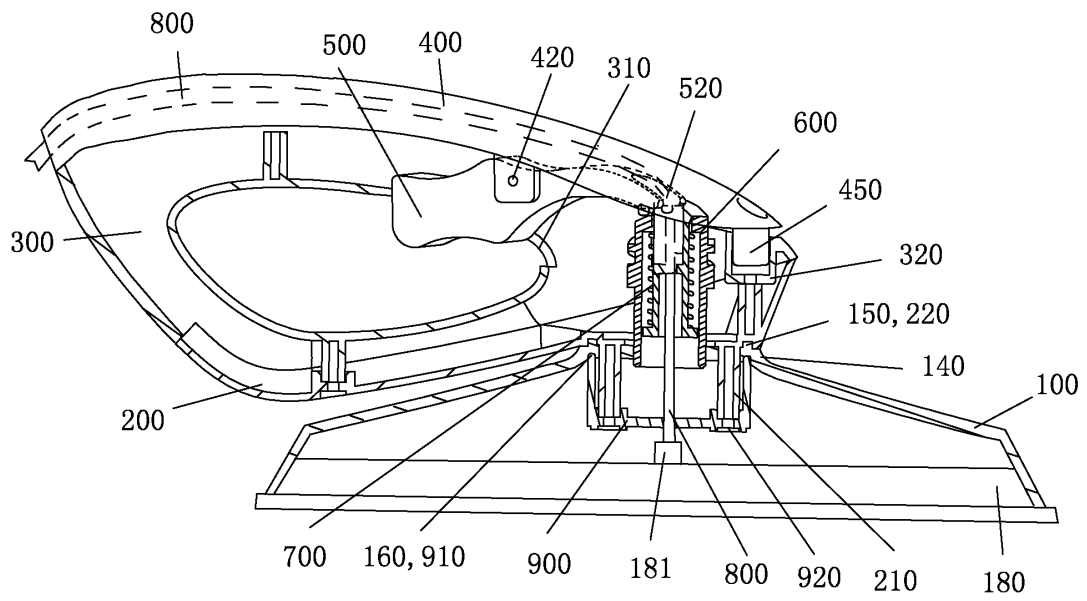


FIG. 12

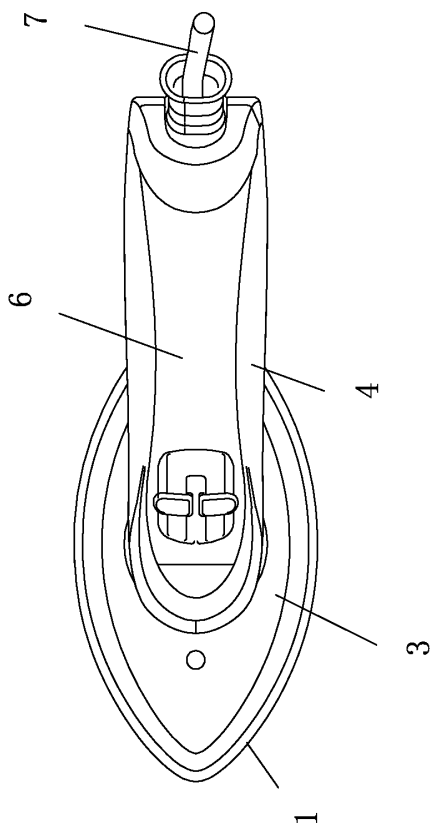


FIG. 10

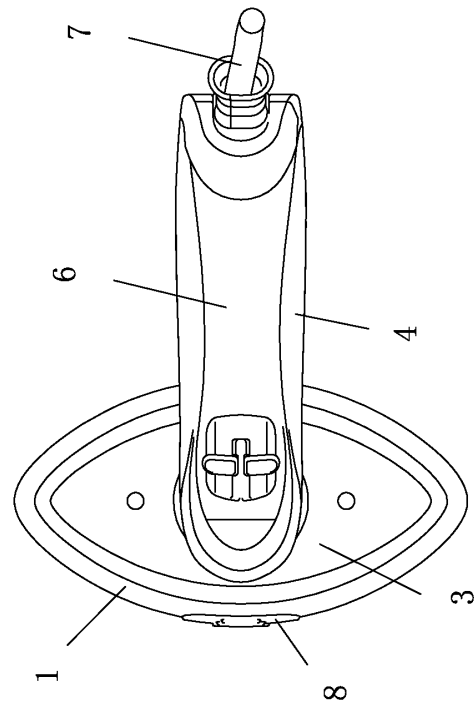


FIG. 11

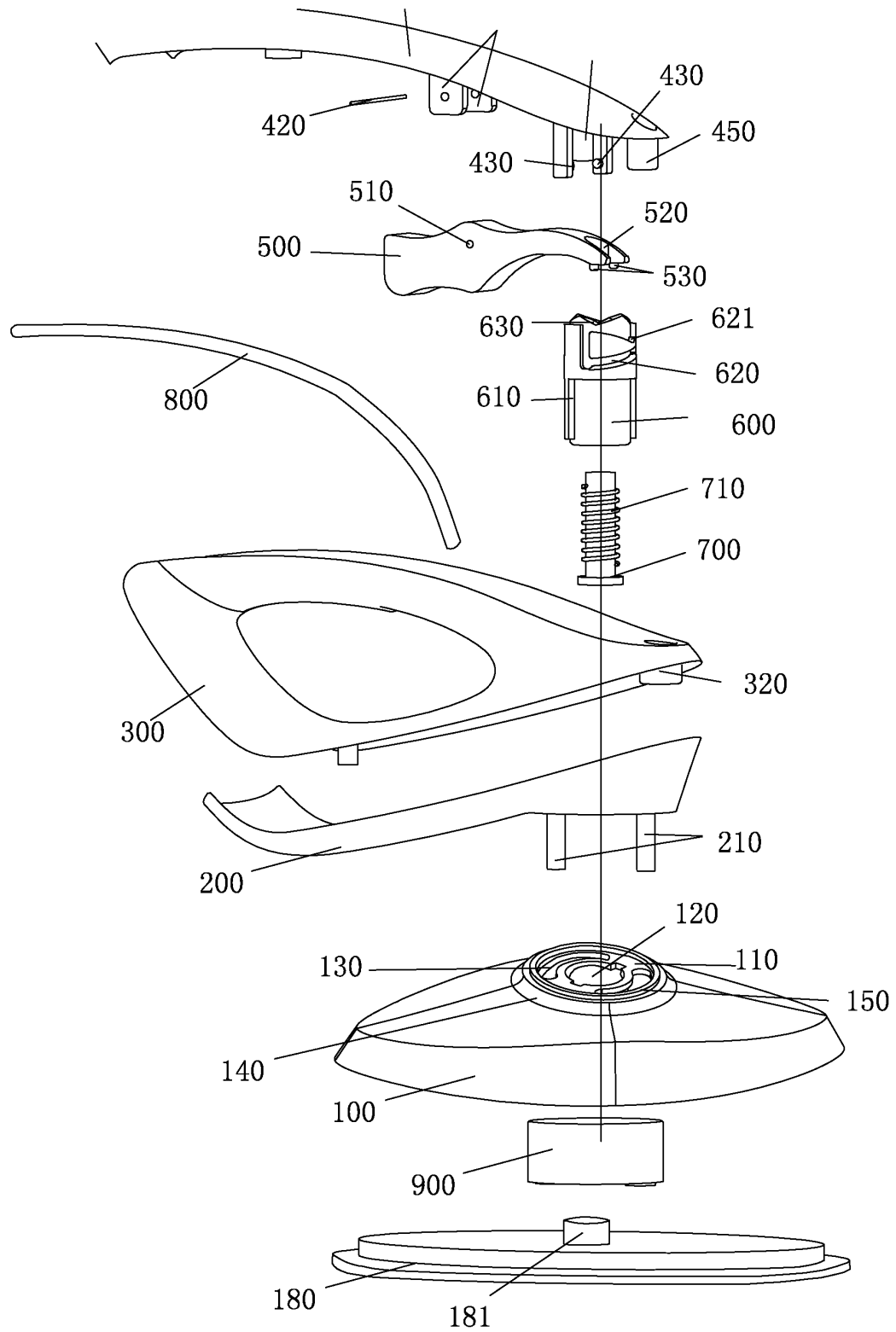


FIG. 13

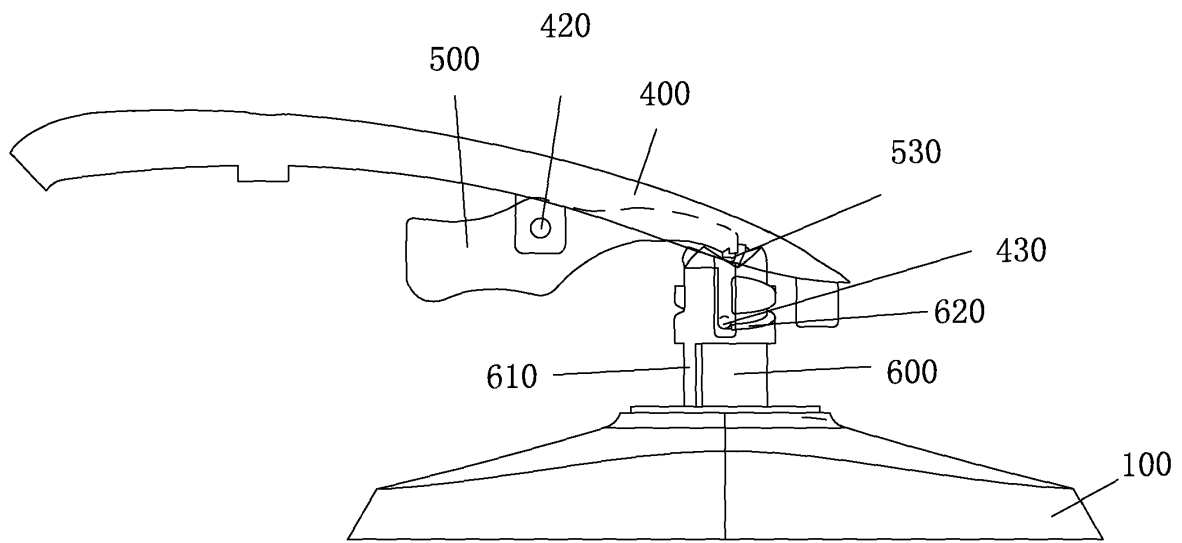


FIG. 14

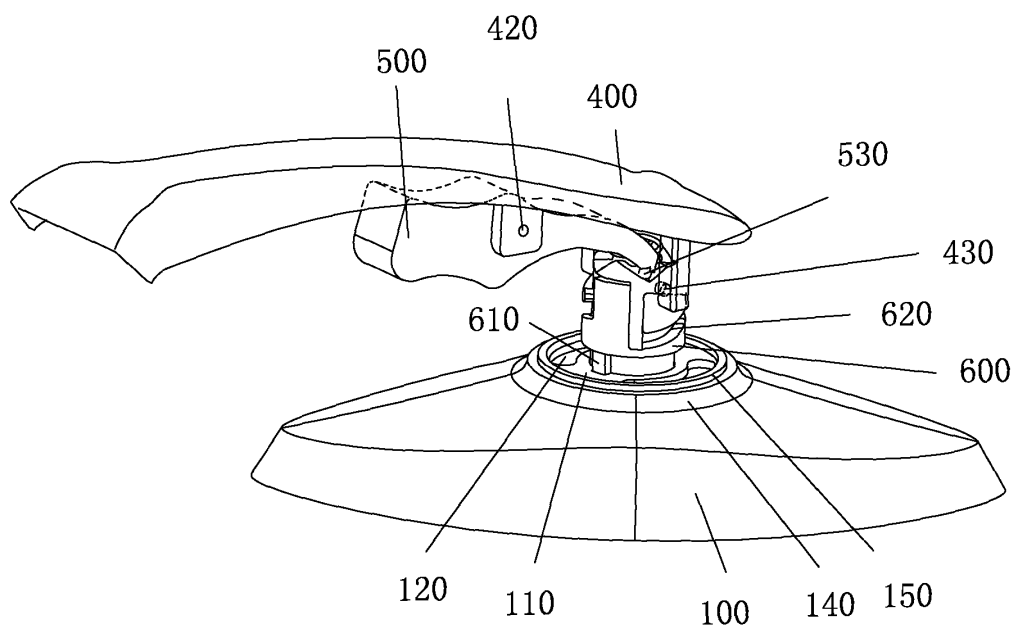


FIG. 15

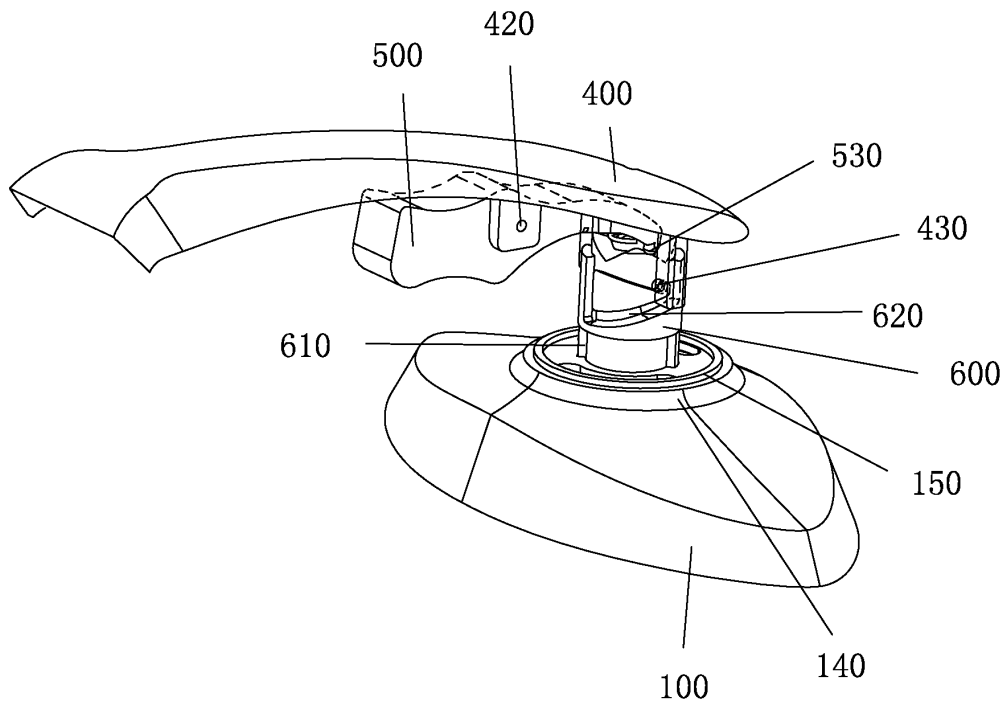


FIG. 16

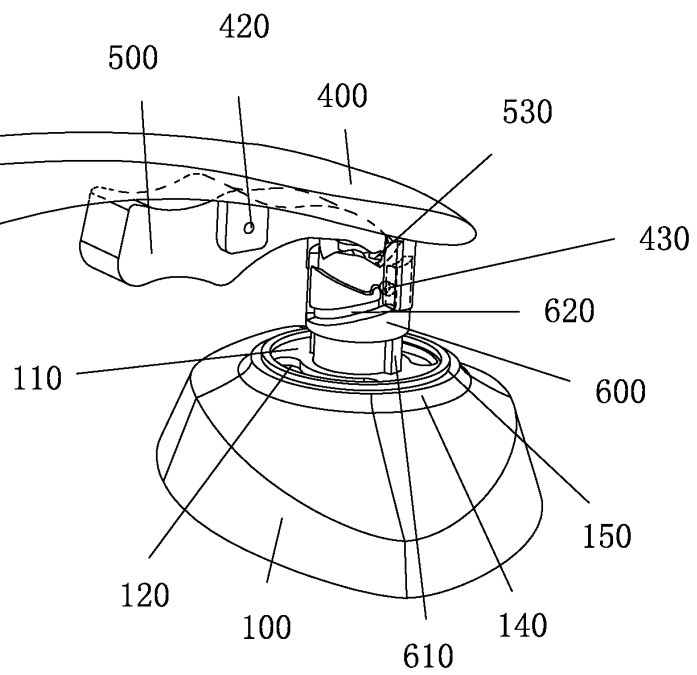


FIG. 17

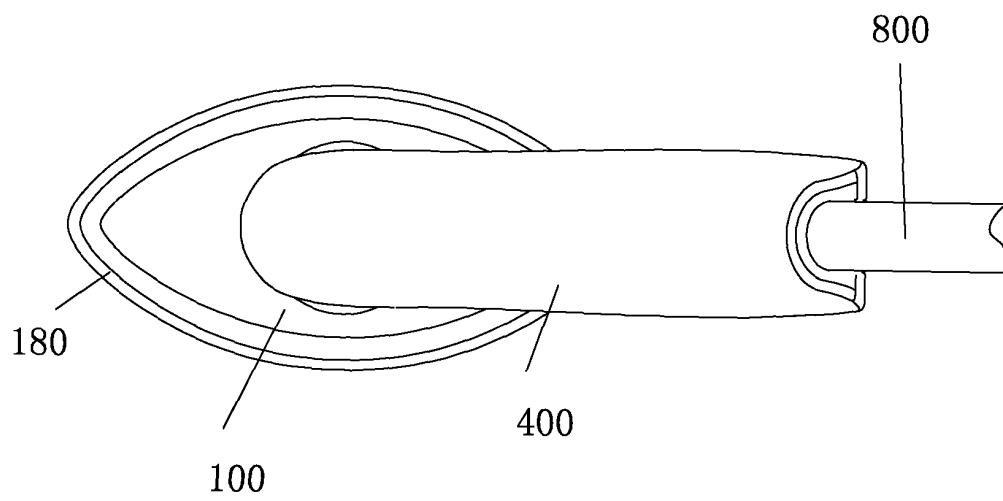


FIG. 18

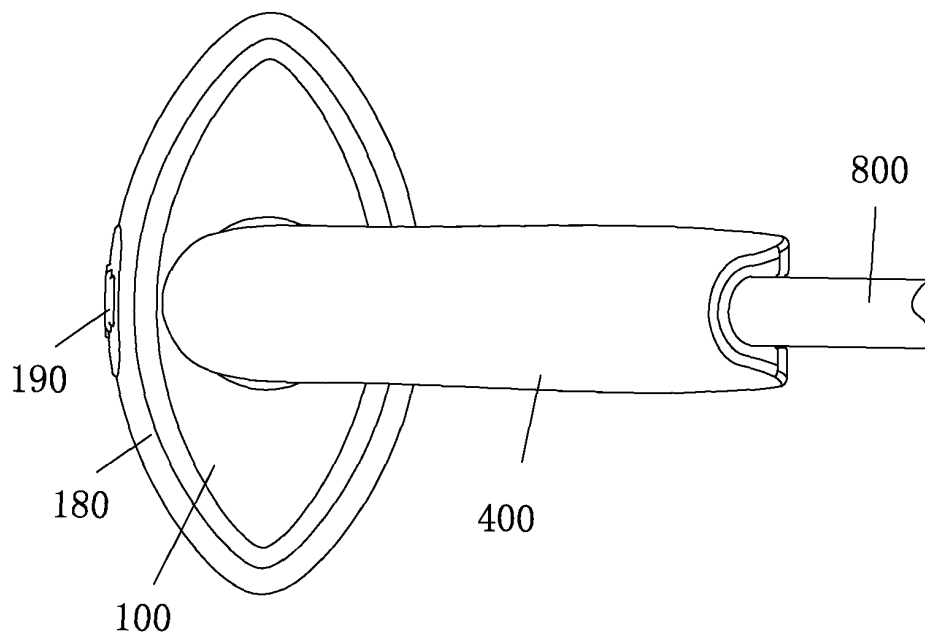


FIG. 19

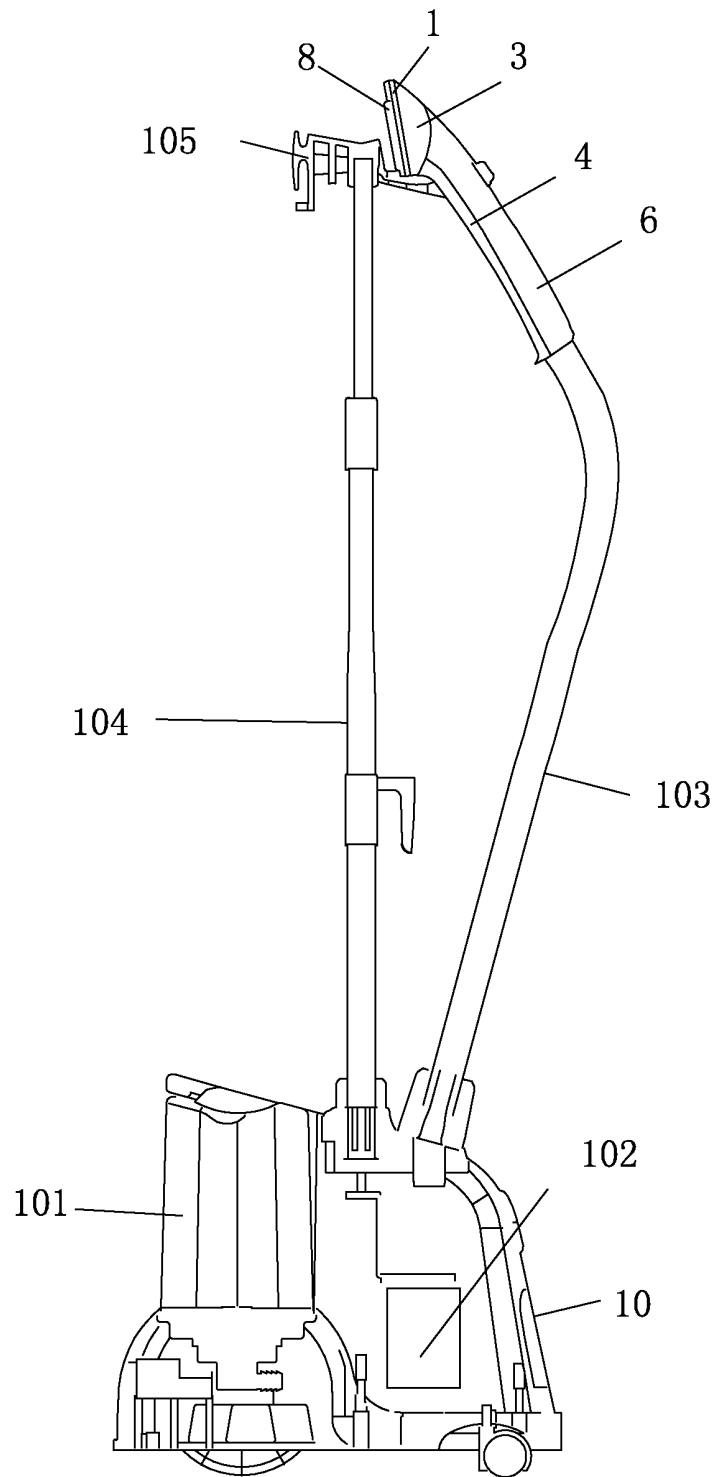


FIG. 20

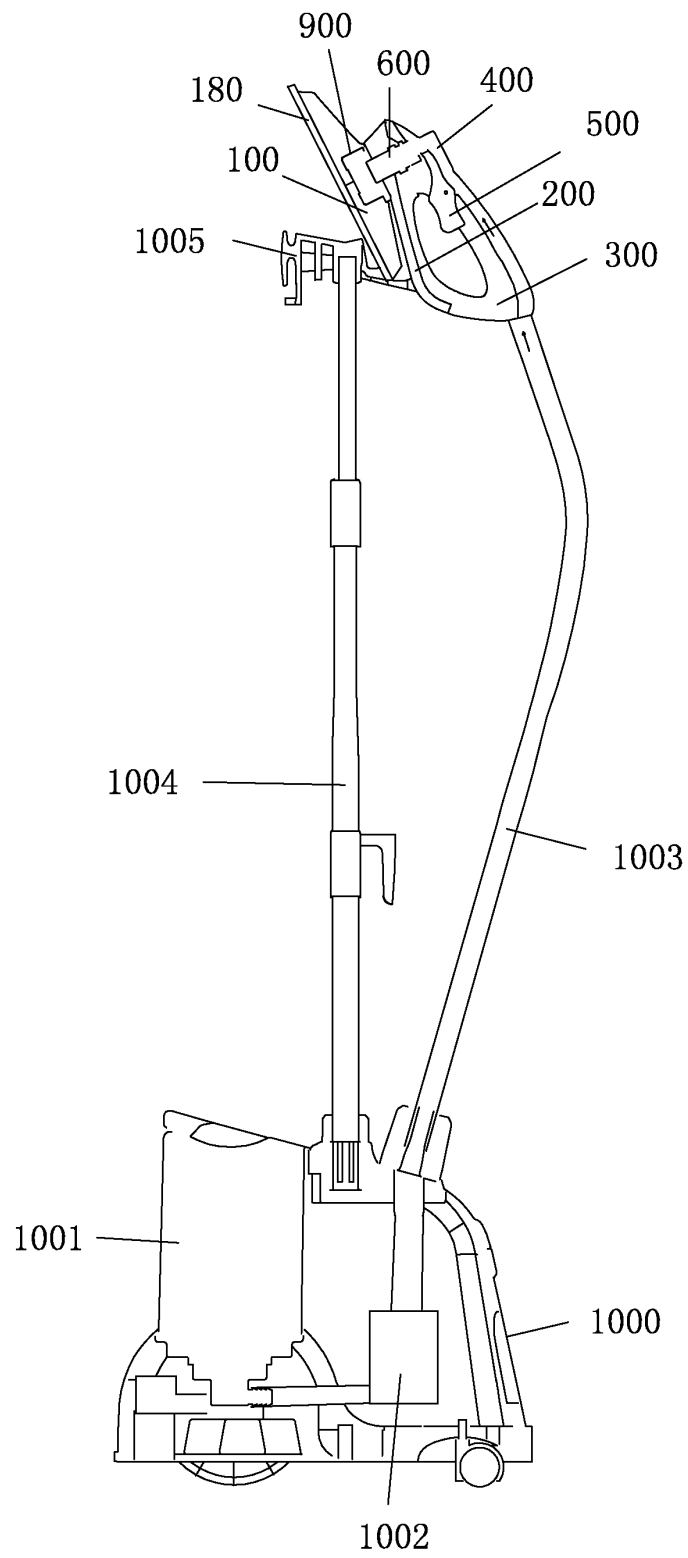


FIG. 21

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2010/073886

A. CLASSIFICATION OF SUBJECT MATTER

See extra sheet

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)

IPC:D06F 75,D06F 79

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, WPI, EPODOC:iron+, rotat+, rotary, pivot+, turn+, movable, flat, hanging

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TW334141U(YEMEN XIN INT CO LTD) 11 Jun.2008(11.06.2008) see page 3 line 4-page 5 line 6 of the description, figures 1-7	1-4
Y		9-11
Y	CN2737819Y(MAIER ELECTRIC APPLIANCES CO L) 02 Nov.2005(02.11.2005) see page 2 paragraph 1-paragraph 2 of the description, figure 1	9-11
X	US2001/0030183A1(BOWEN L L) 18 Oct.2001(18.10.2001) see the abstract figure 1	1
Y		9
X	CN2739220Y(OUYANG WEISHI) 09 Nov.2005(09.11.2005) see the abstract, figure 1	1
Y		9

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

* Special categories of cited documents:	"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
"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	"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
"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)	"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
"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	"&" document member of the same patent family

Date of the actual completion of the international search
03 Sep.2010(03.09.2010)Date of mailing of the international search report
16 Sep. 2010 (16.09.2010)Name and mailing address of the ISA/CN
The State Intellectual Property Office, the P.R.China
6 Xitucheng Rd., Jimen Bridge, Haidian District, Beijing, China
100088
Facsimile No. 86-10-62019451

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2010/073886

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	CN201525972U(CHENG XIFU) 14 Jul.2010(14.07.2010) see paragraph [0022]-[0048] of the description, figures 1-4	1
A	FR2709138A1(SEB SA) 24 Feb.1995(24.02.1995) see the whole document	1-15

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2010/073886

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
TW334141U	11.06.2008	NONE	
CN2737819Y	02.11.2005	NONE	
US2001/0030183A1	18.10.2001	NONE	
CN2739220Y	09.11.2005	NONE	
CN201525972U	14.07.2010	NONE	
FR2709138A1	24.02.1995	NONE	

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

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2010/073886

Continuation of: second sheet A. **CLASSIFICATION OF SUBJECT MATTER**

D06F 75/30 (2006.01) i

D06F 75/08 (2006.01) i

D06F 79/00 (2006.01) i