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(54) **HAIRDRESSING DEVICE, ROTATING MECHANISM, HAIR CLAMPING MECHANISM, SUCTIONING STRUCTURE, AND HAIR CURLING DEVICE**

(57) An automatic hairdressing device, comprising: a handle (1) with an air duct inside; a fan (5) used for guiding air in the air duct; a heating element (4) provided in the air duct and used for heating the air guided in the air duct; and a motor rotating mechanism provided in the handle (1) and comprising a connecting disc (32) rotatably provided at the front part of the air duct and a hair curling column (2) mounted on the connecting disc (32), an air outlet communicated with the air duct being formed on the hair curling column (2), wherein the hair curling column (2) comprises two semi-cylindrical shells (23) with a gap (20) therebetween; the air outlet comprises an air outlet slot (231); and the air outlet slot (231) is obliquely formed on the side of each semi-cylindrical shell (23) facing the gap (20). The hair curling column (2) can automatically wind hair, and the hair wound on the hair curling column (2) can be quickly styled under the action

of hot air. After hair styling is completed, the fan (5) is controlled to operate independently, and the air outlet can blow cold air toward the hair, such that the hair is quickly styled.

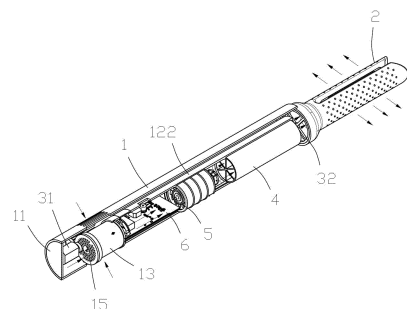


FIG. 2

Description

TECHNICAL FIELD

[0001] The present application relates to a technical field of electronic appliances for hair styling, and in particular, to a motor rotation mechanism, a hair clipping mechanism, a hair adsorption structure, an automatic hairdresser, a hair styling appliance, and a hair curling device.

BACKGROUND

[0002] The hairdresser is a hand-held hairdressing product used to perm the hair. Main components of the hairdresser include a handle and a heating roller. The existing curly hair styling method is as follows: manually winding the hair on a roller, using a relevant heating device to heat up the roller, and maintaining the curling effect for a certain period of time. In the process of manually winding the hair, the temperature of the roller is too high during use, which can easily cause burns and damage the hair. When the styling is over, it is difficult to obtain a better stereotyped effect. In addition, the hair clipping mechanism is not effective, and it is easy to clip the scalp, thereby reducing the user experience.

[0003] Therefore, how to design a hairdresser which can automatically curl hair, avoid scalding and not damage the hair is a technical problem needs to be solved.

SUMMARY

[0004] In view of the deficiencies in the above technologies, the present application provides an automatic hairdresser. In order to solve the above-mentioned technical problems, the technical solution adopted in the present application is:

an automatic hairdresser, including: a handle provided with an air duct inside the handle; a fan configured to guide air flowing in the air duct; a heating element disposed in the air duct and configured to heat the air guided in the air duct; a motor rotation mechanism disposed in the handle, the motor rotation mechanism including a connecting plate rotatably disposed at a front of the air duct; and a hair curling post mounted to the connecting plate, the hair curling post being provided with an air outlet portion which communicates with the air duct; wherein the hair curling post includes two half-post shells and a gap formed between the two half-post shells, the air outlet portion includes an air outlet slot, and the air outlet slot is obliquely opened on a side of the half-post shells facing the gap.

[0005] In an embodiment of the present application, the motor rotation mechanism further includes: a motor being fixedly provided; and a transmission assembly configured to transmit rotational power between the motor and the connecting plate.

[0006] In an embodiment of the present application,

the motor is disposed at a rear of the air duct.

[0007] In an embodiment of the present application, a clipping-plate fixing plate is provided on a side of the half-post shells facing the gap; a clipping plate is slidably disposed on the clipping-plate fixing plate; and wherein a spring is provided between the clipping-plate fixing plate and the clipping plate.

[0008] In an embodiment of the present application, the spring is a compression spring.

10 [0009] In an embodiment of the present application, the air outlet portion further includes a plurality of air outlet holes which are opened on a side of the half-post shells facing away from the gap.

15 [0010] In an embodiment of the present application, an air inlet hole communicating with the air duct is provided on a rear side of the handle; and a filter screen is disposed between the air inlet hole and the air duct.

20 [0011] In an embodiment of the present application, the hair curling post is fastened on the connecting plate in a fast detachable manner.

[0012] In an embodiment of the present application, the fan is disposed in the air duct and located at a rear of the heating element.

25 [0013] In an embodiment of the present application, the automatic hairdresser further includes a printed circuit board; wherein the printed circuit board is disposed in the air duct and located at a rear of the heating element.

30 [0014] Compared with the prior art, the present application has the following beneficial effects: the automatic hairdresser provided by the present application includes

the fan for guiding air in the air duct, the heating element for heating the air guided in the air duct, the hair curling post rotatably disposed at one end of the handle, and the motor rotation mechanism configured to rotate the hair curling post. Based on the above-described structure, the curling post can automatically curl the hair. The hair wrapped around the curling post can be quickly styled under the action of the hot air. When the hair is styled, the fan is controlled to run independently, and the air outlet portion can blow cold air to the hair, so that the hair can be quickly styled. In addition, the present application can automatically curl the hair, which greatly improves user experience. As the heated air provides the heat needed for curling, the surface temperature of the curling post is controlled, thereby reducing the risk of scalding and avoiding hair damage.

35 [0015] In view of the deficiencies in the above technologies, the present application also provides a motor rotation mechanism and an automatic hairdresser having the same. In order to solve the above-mentioned technical problems, the technical solution adopted in the present application is:

40 a motor rotation mechanism, applicable to a hairdresser which includes a handle with an air duct formed inside the handle and a hair curling post rotatably disposed at one end of the handle; wherein the motor rotation mechanism is disposed in the handle and is configured to rotate the hair curling post, the motor rotation mechanism in-

cludes: a motor fixedly disposed at a rear end of the air duct; a connecting plate rotatably disposed at a front of the air duct; and a transmission assembly configured to transmit rotational power between the motor and the connecting plate; wherein the hair curling post is connected to the connecting plate.

[0016] In an embodiment of the present application, the transmission assembly includes: a driving gear fixed on an output shaft of the motor; a driven gear meshing with the driving gear; and a gear set being synchronously rotatable with the driven gear; wherein the connecting plate is fixed on the gear set.

[0017] In an embodiment of the present application, the gear set includes: a first gear; a second gear fixedly connected to the connecting plate; and a third gear meshing with the first gear and the second gear.

[0018] In an embodiment of the present application, a rotating shaft is fixed between the driven gear and the first gear.

[0019] In an embodiment of the present application, a plurality of through grooves are formed on the connecting plate.

[0020] In order to solve the above technical problems, another solution proposed by the present application is: an automatic hairdresser, including the above-mentioned motor rotation mechanism.

[0021] In an embodiment of the present application, the automatic hairdresser further includes a fan disposed in the air duct, and the fan is configured to guide air flowing in the air duct.

[0022] In an embodiment of the present application, the automatic hairdresser further includes a heating element disposed in the air duct, the heating element being configured to heat the air guided in the air duct; wherein the fan is disposed at a rear of the heating element.

[0023] In an embodiment of the present application, the handle is provided with air inlet holes communicating with the air duct.

[0024] In an embodiment of the present application, the air inlet holes are disposed at a rear side of the handle along a circumferential direction of the handle.

[0025] Compared with the prior art, the present application has the following beneficial effects: the motor rotation mechanism provided by the present application can rotate the connecting plate through the motor, and then the curling post can be linked to rotate. Based on the above structure, the hair curling post can automatically wind the hair, which is not only convenient to use, but also improves the hair curling efficiency, thereby greatly improving the user experience. In addition, since the heating element is arranged between the motor and the connecting plate, the air heated by the heating element will not be blown to the motor, thereby prolonging the service life of the motor.

[0026] In view of the deficiencies in the above technologies, the present application also provides a hair clipping mechanism, a hair curling post and an automatic hairdresser. In order to solve the above-mentioned technical

problems, the technical solution adopted in the present application is:

a hair clipping mechanism, applicable to a hair curling post which includes two half-post shells and a gap formed between the two half-post shells; wherein the hair clipping mechanism is disposed on the two half-post shells and includes: two clipping-plate fixing plates disposed oppositely; two clipping plates which are correspondingly slidably disposed on the two clipping-plate fixing plates; and a spring disposed between the clipping-plate fixing plate and the clipping plate; wherein the two clipping-plate fixing plates are correspondingly fixed on a side of the two half-post shells facing the gap.

[0027] In an embodiment of the present application, an accommodating cavity is opened on the clipping-plate fixing plate.

[0028] In an embodiment of the present application, the two clipping-plate fixing plates are abutted against each other and fixed together; and a middle part of the clipping-plate fixing plate is provided with a recessed portion.

[0029] In an embodiment of the present application, a guide rod inserted to the clipping-plate fixing plate is provided on the clipping plate.

[0030] In an embodiment of the present application, the spring is a compression spring.

[0031] In order to solve the above technical problems, another solution proposed by this application is: a hair curling post, including the hair clipping mechanism as described above.

[0032] In an embodiment of the present application, a ventilation cavity is provided in each half-post shell.

[0033] In an embodiment of the present application, a side of the half-post shells facing the gap is provided with an air outlet slot arranged obliquely; and the air outlet slot is configured in communication with the ventilation cavity.

[0034] In order to solve the above-mentioned technical problems, another solution proposed by this application is:

an automatic hairdresser, including the curling post as described above.

[0035] In an embodiment of the present application, the automatic hairdresser further includes a handle with an air duct formed inside the handle; wherein a front of the air duct is provided with a connecting plate, and the hair curling post is mounted to the connecting plate.

[0036] Compared with the prior art, the present application has the beneficial effect that the hair clipping mechanism provided by the present application can clip the ends of the hair through the two clipping plates which are slidably arranged on the two clipping-plate fixing plates under the action of elastic force. In this way, the ends of the hair can be relatively fixedly wound around the curling post. When more hair is clipped or the curling force is stronger, the two clipping plates can compress the spring to move away from each other, so as to obtain a larger hair clipping space, thereby solving the problem

that the hair has a strong feeling of being pinched.

[0037] In view of the deficiencies in the above technologies, the present application also provides a hair adsorption structure and an automatic hairdresser having the same.

[0038] In order to solve the above-mentioned technical problems, the technical solution adopted in the present application is: a hair adsorption structure, a hair adsorption structure, including: an end shell; and two half-post shells arranged oppositely with a gap formed between the two half-post shells; wherein the two half-post shells are integrally formed at a front of the end shell, and a side of the half-post shells facing the gap is provided with an air outlet slot arranged obliquely; an angle is formed between an inclination direction of the air outlet slot and a center plane of the gap, so that air is blown out along a height direction of the gap.

[0039] In an embodiment of the present application, a ventilation cavity communicated with the air outlet slot is provided in the half-post shell.

[0040] In an embodiment of the present application, a plurality of air outlet holes communicated with the ventilation cavity are opened on a side of the half-post shells facing away from the gap.

[0041] In an embodiment of the present application, a front end of each of the half-post shells is provided with a chamfer; two chamfers are configured as an outwardly expanding opening which communicates with the gap.

[0042] In an embodiment of the present application, a clipping-plate fixing plate is provided on a side of the half-post shells facing the gap; a clipping plate is slidably disposed on the clipping-plate fixing plate; and wherein a spring is provided between the clipping-plate fixing plate and the clipping plate.

[0043] In an embodiment of the present application, the spring is a compression spring.

[0044] In order to solve the above technical problems, another solution proposed by this application is: an automatic hairdresser, including the above-mentioned hair adsorption structure.

[0045] In an embodiment of the present application, the automatic hairdresser further includes a handle with an air duct formed inside the handle; wherein the air duct is configured to communicate with the air outlet slot; and a heating element and a fan are installed in the air duct.

[0046] In an embodiment of the present application, a front of the air duct is rotatably provided with a connecting plate; and the end shell is mounted to the connecting plate.

[0047] In an embodiment of the present application, a motor is fixed in the handle; and rotational power is transmitted between the motor and the connecting plate through a transmission assembly.

[0048] Compared with the prior art, the present application has the following beneficial effects:

the hair adsorption structure provided by the present application includes two half-post shells with a gap formed between the two half-post shells, and an obliquely con-

figured air outlet slot is provided on the side of the half-post shell facing the gap. Based on the above structure, when the air is blown out from the air outlet slot, a negative pressure area will appear in a direction opposite to the blowing direction. At this time, the hair ends in the negative pressure area can be sucked and blown, so that the hair can be smoothly placed in the gap. Through the above method, the orderliness of the hair winding is ensured, and it is beneficial to obtain a better styling effect.

[0049] In view of the deficiencies in the above technologies, the present application also provides a hair styling appliance. In order to solve the above-mentioned technical problems, the technical solution adopted in this application is:

a hair styling appliance, including: a handle for an operator to hold, the handle having an air duct formed inside the handle; a rod member disposed at one end of the handle, an inside the rod member being hollow to form an accommodating cavity communicating with the air duct, an air outlet hole being formed on an outer peripheral surface of the rod member, the air outlet hole communicating with the air duct through the accommodating cavity; a first heating element disposed in the accommodating cavity and configured to heat the rod member; a fan disposed in the air duct; the fan being configured to blow air, so that an air flow in the air duct flows out through the air outlet hole after entering the accommodating cavity; and a second heating element disposed in the air duct and configured to assist heating in cooperation with the first heating element; wherein the rod member includes a styling state when the first heating element and the second heating element are heated, and a styled state when the first heating element and the second heating element are not heated.

[0050] In an embodiment of the present application, the first heating element includes a plurality of PTC resistive plates and a resistor plate mounting bracket for mounting the PTC resistive plates; and wherein the PTC resistor plates are disposed in close contact with an inner wall of the rod member.

[0051] In an embodiment of the present application, the resistor plate mounting bracket includes: a shaft; and a plurality of holders arranged on the shaft along a circumferential direction of the shaft; wherein a space is formed between the holders, and the PTC resistor plate is inserted in the space.

[0052] In an embodiment of the present application, a side of the holders is provided with a plurality of heat sinks.

[0053] In an embodiment of the present application, the number of the PTC resistive plates is three.

[0054] In an embodiment of the present application, the second heating element includes: a heating wire mounting bracket having a ventilation cavity inside the heating wire mounting bracket; and a heating wire wound around the ventilation cavity; wherein an end of the heating wire mounting bracket is provided with a limiting plate, so as to limit the heating wire in the ventilation cavity.

[0055] In an embodiment of the present application, the handle is provided with a plurality of air inlet holes communicating with the air duct; and wherein the air inlet holes are arranged on a rear side of the handle along a circumferential direction of the handle.

[0056] In an embodiment of the present application, the second heating element and the fan are both disposed in the air duct; and wherein the fan is disposed at a rear of the second heating element.

[0057] In an embodiment of the present application, the hair styling appliance further includes a printed circuit board; wherein the printed circuit board is disposed in the air duct and at the rear of the second heating element.

[0058] In an embodiment of the present application, the hair styling appliance further includes a hair clipping plate configured to be pressed against an outside of the rod member, the hair clipping plate being pivotally connected to a front side of the handle through a plate sleeve; wherein an elastic member for resetting the plate sleeve is arranged between the handle and the plate sleeve.

[0059] Compared with the prior art, the present application has the following beneficial effects: the hair styling appliance provided by the present application includes the fan for guiding air in the air duct, the second heating element for heating the air guided in the air duct, and a first heating element for heating the rod member. Based on the above structure, the hair wound on the rod body can be quickly styled under the dual action of the heated rod body and the hot air. When the hair is styled, the fan is controlled to run alone, and the cold air can be blown from the air outlet hole to the hair, so that the hair can be quickly styled. In addition, since the heated air can supplement the heat required for curling, the surface temperature of the rod member does not need to be too high, thereby reducing the risk of scalding and avoiding hair damage.

[0060] In view of the deficiencies in the above technologies, the present application also provides a new hair curling device. In order to solve the above-mentioned technical problems, the technical solution adopted in this application is:

a hair curling device, including: a handle; a styling body connected with the handle, the styling body including an outer shell for hair to be wound around, the outer shell being provided with an air outlet hole; and a transmission mechanism disposed between the handle and the styling body; wherein the styling body further includes a hair clipping gap arranged on an inner side of the outer shell; two sides of the hair clipping gap are provided with a clipping member, respectively; and at least one of the clipping members is connected to the transmission mechanism; and wherein the transmission mechanism includes an inclined surface matching structure to realize expansion or reverse contraction of the hair clipping gap.

[0061] In an embodiment of the present application, the transmission mechanism includes an operable moving bracket, a support plate disposed in parallel with the clipping member, a first inclined surface matching struc-

ture disposed between the moving bracket and the support plate, and a second inclined surface matching structure disposed between the support plate and the clipping member; the first inclined surface matching structure converts a movement of the moving bracket along a first direction into a lifting movement of the support plate relative to the styling body; and the second inclined surface matching structure converts the lifting movement of the support plate into a telescopic movement of the clipping member along a second direction.

[0062] In an embodiment of the present application, the first direction is a lateral direction, the moving bracket is operable to translate in the lateral direction, and a sliding rail for a relative movement of the moving bracket is fixed in the styling body.

[0063] In an embodiment of the present application, the styling body extends in a longitudinal direction, the first direction is a circumferential direction around the longitudinal direction, and the moving bracket is operatively rotatable in the circumferential direction.

[0064] In an embodiment of the present application, the first inclined surface matching structure includes a first inclined portion provided on one of the moving bracket and the support plate, and a first sliding portion provided on a remaining one of the moving bracket and the support plate; the first sliding portion is slidably matched with the first inclined portion; and a height of the first inclined portion decreases along a moving direction of the moving bracket.

[0065] In an embodiment of the present application, the first sliding portion is an arc surface, and the first inclined portion is a straight inclined surface or a spiral inclined surface.

[0066] In an embodiment of the present application, the first inclined surface matching structure further includes a limiting portion, and the limiting portion is disposed on an upper end of the first inclined portion so as to prevent the first sliding portion from being separated from the first inclined portion.

[0067] In an embodiment of the present application, the second inclined surface matching structure includes a second inclined portion provided on one of the support plate and the clipping member, and a second sliding portion provided on a remaining one of the support plate and the clipping member; the second sliding portion is slidably matched with the second inclined portion and pushes the clipping member to translate.

[0068] In an embodiment of the present application, the second inclined portion extends from the support plate toward the clipping member, the second sliding portion extends toward the support plate from the clipping member, and a free end of the second inclined portion is provided with a barb to prevent the second sliding portion from slipping off.

[0069] In an embodiment of the present application, an operation portion is provided on the moving bracket, and the operation portion exposes the outer shell of the styling body for operation.

[0070] Compared with the prior art, the present application has the beneficial effect that the hair curling device proposed in the present application includes the hair clipping gap for holding the hair. The transmission mechanism is operable to convert the external force acting on the hair curling device into an extending or retracting movement of the clipping member toward the hair clipping gap through the inclined surface matching structure. Finally, the flexible opening and closing of the hair clipping gap is realized, and there is no need to worry about the styling failure due to slipping of the hair.

[0071] In view of the deficiencies in the above technologies, the present application also provides a new hair curling device. In order to solve the above-mentioned technical problems, the technical solution adopted in this application is:

a hair curling device, including: a handle; a styling body connected with the handle, the styling body including an outer shell for hair to be wound around, the outer shell being provided with an air outlet hole; and a transmission mechanism disposed between the handle and the styling body; wherein the styling body further includes a hair clipping gap arranged on an inner side of the outer shell; two sides of the hair clipping gap are provided with a clipping member, respectively; and at least one of the clipping members is connected to the transmission mechanism; and wherein the transmission mechanism is configured as a linkage mechanism to realize expansion or reverse contraction of the hair clipping gap.

[0072] In an embodiment of the present application, the linkage mechanism includes a sliding member and a swinging member, one end of the swinging member is pivotally connected to the sliding member, another end of the swinging member is pivotally connected to the clipping member, and the swinging member converts a translational movement of the sliding member in a first direction into a telescopic movement of the clipping member.

[0073] In an embodiment of the present application, two linkage mechanisms are provided, each clipping member is connected with one linkage mechanism, the two linkage mechanisms share the sliding member, and the swinging members of the two linkage mechanisms are arranged on two sides of the sliding member, respectively.

[0074] In an embodiment of the present application, the first direction is parallel to a longitudinal axis direction of the styling body, two swinging members are respectively connected on two sides of the sliding member, and the two swinging members on a same side are arranged parallel to each other.

[0075] In an embodiment of the present application, the linkage mechanism includes two sliding members, one end of the swinging member is located between the two sliding members, and the swinging piece and the sliding piece are connected by a pin.

[0076] In an embodiment of the present application, the first direction is perpendicular to a longitudinal axis

direction of the styling body, the linkage mechanism further includes an intermediate member connecting the clipping member and the swinging member, the intermediate member is configured in an L shape having a first end extending generally laterally and a second end portion extending generally longitudinally, the first end portion is provided with a hole through which a pivot shaft of the swinging member passes, and the second end portion is fixedly connected with the clipping member.

[0077] In an embodiment of the present application, the sliding member is configured as a slider, a sliding rail is fixedly arranged in the styling body, and the slider reciprocates in the sliding rail.

[0078] In an embodiment of the present application, a free end of the slider protrudes beyond the styling body so as to be configured as an operation portion.

[0079] In an embodiment of the present application, the clipping member includes a support plate connected to the linkage mechanism.

[0080] In an embodiment of the present application, the clipping member further includes a floating clipping plate disposed on one side of the support plate adjacent to the hair clipping gap, a restoring member is disposed between the floating clipping plate and the support plate, and an elastic restoring force of the restoring member biases the floating clipping plate in a direction adjacent to the hair clipping gap.

[0081] Compared with the prior art, the present application has the beneficial effects that the hair curling device proposed in the present application includes the hair clipping gap for holding the hair, and can realize flexible opening and closing of the hair clipping gap through the simple and compact transmission mechanism. As a result, there is no need to worry about the styling failure due to slipping of the hair.

[0082] In view of the deficiencies in the above technologies, the present application also provides a new hair curling device. In order to solve the above-mentioned technical problems, the technical solution adopted in this application is:

a hair curling device, including: a handle; a styling body movably connected with the handle, the styling body including two half-shell assemblies, and the half-shell assemblies being provided with air outlet holes; and a transmission mechanism connected with at least one of the half-shell assemblies, the transmission mechanism being operable to drive at least one of the half-shell assemblies to translate relative to a remaining one of the half-shell assemblies so as to form an openable and closable hair clipping gap.

[0083] In an embodiment of the present application, the transmission mechanism includes a gear structure, and the gear structure translates the half-shell assemblies relative to the handle by rotating.

[0084] In an embodiment of the present application, the gear structure includes a motor, a gear sleeved on the motor and a rack intermeshing with the gear; and the rack is disposed at a bottom of at least one of the half-

shell assemblies.

[0085] In an embodiment of the present application, the gear includes a driving wheel and a driven wheel intermeshing with the driving wheel, the motor includes an output shaft, and the driving wheel is sleeved on the output shaft.

[0086] In an embodiment of the present application, the gear structure further includes a gear carrier between the motor and the gear, and the gear carrier is provided with a protruding post for mechanical connection with the gear.

[0087] In an embodiment of the present application, the transmission mechanism includes a swinging rod structure, and the swinging rod structure translates the half-shell assemblies relative to the handle by rotating.

[0088] In an embodiment of the present application, the swinging rod structure includes a swinging rod, a sliding rail cooperating with the swinging rod, and a pivot shaft; and the swinging rod is rotatable around the pivot shaft.

[0089] In an embodiment of the present application, a protruding slider is provided at a free end of the swinging rod, the sliding rail is disposed at a bottom end of at least one of the half-shell assemblies, and the slider moves within the sliding rail.

[0090] In an embodiment of the present application, the swinging rod structure further includes an operating rod; one end of the operating rod is connected with the swinging rod through the pivot shaft, and another end of the operating rod extends out of a receiving groove of the handle.

[0091] In an embodiment of the present application, an upper end of the handle is provided with a sliding slot, a bottom end of the half-shell assemblies is provided with a protrusion, and the protrusion is received in the sliding slot and movable along the sliding slot.

[0092] Compared with the prior art, the present application has the beneficial effects that the hair curling device proposed by the present application realizes the relative translation of the two half-shell assemblies through the simple transmission mechanism, thereby forming an openable and closable hair clipping gap. This facilitates the placement and clipping of the hair without worrying about the styling failure due to hair slipping during the curling process.

BRIEF DESCRIPTION OF DRAWINGS

[0093]

FIG. 1 is a schematic view of an external structure of an automatic hairdresser in a first embodiment of the present application;

FIG. 2 is a first schematic view of an internal structure of the automatic hairdresser in the first embodiment of the present application;

FIG. 3 is a second schematic view of the internal structure of the automatic hairdresser in the first embodiment of the present application;

FIG. 4 is an exploded structure schematic view of the automatic hairdresser in the first embodiment of the present application;

FIG. 5 is a schematic structural view of a motor rotation mechanism in the first embodiment of the present application;

FIG. 6 is a schematic view of a connection structure of a filter screen bottom plate and a lower bottom plate in the first embodiment of the present application;

FIG. 7 is a schematic structural view of a curling post in the first embodiment of the present application;

FIG. 8 is a schematic structural view of a clipping plate in a state of clipping hair in the first embodiment of the present application;

FIG. 9 is a schematic structural view of a clipping plate in a state of being retracted into an accommodating cavity in the first embodiment of the present application;

FIG. 10 is a schematic view of an exploded structure of a hair clipping mechanism in the first embodiment of the present application;

FIG. 11 is a schematic view of a curling post in a state of adsorbing hair in the first embodiment of the present application;

FIG. 12 is a schematic cross-sectional view of the curling post in the first embodiment of the present application;

FIG. 13 is a schematic view of an external structure of a hair styling appliance in a second embodiment of the present application;

FIG. 14 is a schematic view of an internal structure of a hair styling appliance in the second embodiment of the present application;

FIG. 15 is a schematic view of an exploded structure of the hair styling appliance in the second embodiment of the present application;

FIG. 16 is a front view of a structure of a first heating element in the second embodiment of the present application;

FIG. 17 is a first structural schematic view of a re-

sistor plate mounting bracket in the second embodiment of the present application;

FIG. 18 is a second structural schematic view of the resistor plate mounting bracket in the second embodiment of the present application;

FIG. 19 is a schematic structural view of a second heating element in the second embodiment of the present application;

FIG. 20 is a schematic view of a connection structure of a filter screen bottom plate and a lower bottom plate in the second embodiment of the present application;

FIG. 21 is a schematic view of an overall structure of a hair curling device in a third embodiment of the present application;

FIG. 22 is a schematic view of an overall structure of a styling body shown in FIG. 21;

FIG. 23 is a schematic view of a partially exploded structure of the styling body in a first example of the third embodiment of the present application;

FIG. 24 is a schematic cross-sectional structure view of the styling body in FIG. 23 after removing an outer shell;

FIG. 25 is a schematic view of an exploded structure of the styling body in FIG. 24 after removing the outer shell;

FIG. 26 is a partial exploded structural view of the styling body in a second example of the third embodiment of the present application;

FIG. 27 is a schematic cross-sectional structure view of the styling body in FIG. 26 after removing the outer shell;

FIG. 28 is a schematic view of the exploded structure of the styling body in FIG. 27 after removing the outer shell;

FIG. 29 is a schematic view of an overall structure of a hair curling device in a fourth embodiment of the present application;

FIG. 30 is a schematic view of an overall structure of a styling body shown in FIG. 29;

FIG. 31 is a schematic view of an exploded structure of the styling body in a first example of the fourth embodiment of the present application;

FIG. 32 is a schematic cross-sectional structure view of the styling body in FIG. 31;

FIG. 33 is a schematic view of the exploded structure of the styling body in a second example of the fourth embodiment of the present application;

FIG. 34 is a schematic cross-sectional structure view of the styling body in the second example of the fourth embodiment of the present application;

FIG. 35 is a schematic view of an overall structure of a hair curling device in a first preferred example of a fifth embodiment of the present application;

FIG. 36 is a partial exploded structural view of the hair curling device shown in FIG. 35;

FIG. 37 is a schematic view of an exploded structure of a styling body and a transmission mechanism of the hair curling device shown in FIG. 35;

FIG. 38 is a schematic top view of a styling body and the transmission mechanism in FIG. 37;

FIG. 39 is a schematic view of an overall structure of the hair curling device in a second preferred example of the fifth embodiment of the present application;

FIG. 40 is a schematic view of a partially exploded structure of the hair curling device shown in FIG. 39;

FIG. 41 is a schematic view of an exploded structure of the styling body and the transmission mechanism of the hair curling device shown in FIG. 39; and

FIG. 42 is a schematic top view of the styling body and the transmission mechanism shown in FIG. 41.

[0094] In the drawings: 1, handle; 10, air inlet hole; 11, rear bottom plate; 121, first mounting bracket; 122, second mounting bracket; 13, filter screen; 130, filter screen holder; 14, filter screen bottom plate; 141, twist groove; 15, lower bottom plate; 150, rear air inlet hole; 151, twist button; 2, hair curling post; 20, gap; 21, end shell; 210, connecting cavity; 22, half-post shell assembly; 23, half-post shell; 230, ventilation cavity; 231, air outlet slot; 24, air outlet hole; 25, clipping-plate fixing plate; 250, accommodating cavity; 251, recessed portion; 26, clipping plate; 261, guide rod; 27, chamfer; 31, motor; 32, connecting plate; 320, through groove; 33, transmission assembly; 331, driving gear; 332, driven gear; 333, rotating shaft; 334, first gear; 335, third gear; 336, second gear; 4, heating element; 41, heating wire mounting bracket; 42, limiting plate; 5, fan; 50, shock-absorbing ring; 6, printed circuit board; a, included angle; 7, hair clipping plate; 70, ventilation hole; 71, second fastener; 8, plate

sleeve; 81, pressing plate; 9, elastic member; 91, fixing seat; 1011, rotating shaft; 111, third fastener; 12, mounting bracket assembly; 1002, rod body; 1021, front limit block; 1022, top cover; 221, first fastener; 1023, sealing gasket; 3, first heating element; 30, resistor plate mounting bracket; 1031, shaft rod; 310, slot; 1032, holder; 321, fixing plate; 322, space; 323, heat sink; 324, rear limit block; 1033, PTC resistor plate; 1004, second heating element;

[0095] 2001, handle; 2002, styling body; 2021, outer shell; 2210, air outlet hole; 2212, 2212', receiving hole; 2022, inner bracket; 2221, positioning post; 2023, clipping member; 2024, support plate; 2241, first sliding portion; 2242, second sliding portion; 2243, second inclined portion; 2245, barb; 2026, positioning hole; 2033, 2033', limiting portion; 2035, 2035', operation portion; 2004, sliding rail; 2008, hair clipping gap; 2009, mounting sleeve;

[0096] 401, handle; 402, styling body; 421, shell; 4210, air outlet hole; 422, inner bracket; 423, clipping member; 424, support plate; 425, floating clipping plate; 426, positioning post; 403, sliding member; 431, sliding rail; 432, slider; 404, swinging member; 451, bolt; 452, nut; 406, intermediate member; 461, first end portion; 462, second end portion; 463, limiting portion; 407, spring; 408, hair clipping gap; 409, mounting sleeve;

[0097] 501, handle; 513, sliding slot; 502, styling body; 521, half-shell assembly; 5210, air outlet hole; 5211, protrusion; 5212, receiving groove; 503, gear; 531, driving wheel; 532, shaft hole; 533, driven wheel; 535, gear carrier; 5351, protruding post; 504, motor; 541, output shaft; 505, rack; 506, swinging rod; 561, slider; 563, pivot shaft; 565, operating rod; 507, sliding rail.

DETAILED DESCRIPTION

[0098] In order to make the above objects, features and advantages of the present application more clearly understood, the specific embodiments of the present application will be described in detail below with reference to the accompanying drawings. It should be understood that the specific embodiments described herein are only used to explain the present application, but not to limit the present application. In addition, it should be noted that, for the convenience of description, the drawings only show some but not all structures related to the present application. Based on the embodiments in the present application, all other embodiments obtained by those of ordinary skill in the art without creative efforts shall fall within the protection scope of this application.

[0099] The terms "comprising" and "including" and any variations thereof in this application are intended to cover a non-exclusive inclusion. For example, a process, method, system, product or device comprising a series of steps or elements is not limited to the listed steps or elements, but may optionally also include unlisted steps or elements; or, optionally, other steps or units inherent to these processes, methods, products or devices are also

included.

[0100] Reference herein to an "embodiment" means that a particular feature, structure, or characteristic described in connection with the embodiment can be included in at least one embodiment of the present application. The appearances of the phrase in various places in the specification are not necessarily all referring to the same embodiment, nor a separate or alternative embodiment that is mutually exclusive of other embodiments. It is explicitly and implicitly understood by those skilled in the art that the embodiments described herein may be combined with other embodiments.

[0101] As shown in FIG. 1 to FIG. 12, the present application provides an automatic hairdresser which includes: a handle 1 with an air duct inside, a fan 5 configured to guide air in the air duct, a heating element 4 configured to heat the air guided in the air duct, a hair curling post 2 rotatably arranged at one end of the handle 1, and a motor rotation mechanism disposed in the handle 1 and configured to rotate the hair curling post 2. Wherein, the air duct has an inlet end and an outlet end. The handle 1 is provided with a plurality of air inlet holes 10 communicating with the inlet end of the air duct. The hair curling post 2 is provided with an air outlet portion communicating with the outlet end of the air duct.

[0102] Specifically, both the motor rotation mechanism and the fan 5 can operate independently; and the heating element 4 can cooperate with the fan 5 to operate.

[0103] For convenience of description, in this application, an installation direction of the hair curling post 2 is defined as a front end, and an installation direction of the handle 1 is defined as a rear end.

[0104] It is understandable that the present application allows for quick automatic styling of hair. The process of quick automatic styling is as follows: securing the end of a strand of hair to the hair curling post 2; activating the motor rotation mechanism to wind the hair on the hair curling post 2 clockwise/counterclockwise; and operating the heating element 4 and the fan 5 simultaneously. Under the action of the fan 5, the air enters the air duct from the air inlet holes 10. The air guided in the air duct is heated by the heating element 4, and the hot air is discharged to the hair by the air outlet portion. In the above-described manner, the hair wound on the hair curling post 2 can be styled quickly and automatically.

[0105] When the hair is finished styling, the present application allows for quick styling of the hair. In the process of quick styling, the fan 5 is operated alone. Under the action of the fan 5, the air enters the air duct from the air inlet holes 10, and the cool air is discharged to the styled hair by the air outlet portion. As a result, the hair wound on the hair curling post 2 can be quickly styled.

[0106] Of course, in this application, the motor rotation mechanism can also be disabled from beginning to end. The heating element 4 and the fan 5 can be operated according to the needs of use, so as to manually perform hair modeling and styling.

[0107] In one embodiment, a mounting bracket assem-

bly is fixed in the handle 1, and the air duct is formed in the mounting bracket assembly.

[0108] Specifically, the mounting bracket assembly includes a first mounting bracket 121 and a second mounting bracket 122 which can be fastened to each other. Wherein, the first mounting bracket 121 and the second mounting bracket 122 are substantially half-cylindrical shells, and after the two are fastened together, a cylindrical shell can be formed. That is, the air duct is formed in the cylindrical shell.

[0109] Furthermore, the heating element 4 includes a heating wire mounting bracket 41. A ventilation cavity (not shown in the drawings) is formed inside the heating wire mounting bracket 41. A heating wire (not shown in the drawings) is wound around the ventilation cavity. The air guided by the fan 5 can all flow through the ventilation cavity. When the heating wire is energized, it can effectively heat the guided air.

[0110] Furthermore, two ends of the heating wire mounting bracket 41 are provided with a plurality of limiting plates 42 which can limit the heating wire in the ventilation cavity. As a result, the heating wire can be prevented from coming out of the heating wire mounting bracket 41, and two ends of the ventilation cavity can be in a state of air circulation.

[0111] In the specific application scenario of the present application, the number of limiting plates 42 at each end of the heating wire mounting bracket 41 is six. The limiting plates 42 are uniformly fixed to the heating wire mounting bracket 41 along a circumferential direction of the heating wire mounting bracket 41.

[0112] In order to improve the heating efficiency of the flowing air, the heating element 4 is restricted to be arranged in the air duct. At the same time, in order to improve the air conduction efficiency, the fan 5 is also restricted to be arranged in the air duct.

[0113] Wherein, the heating element 4 may be arranged at a front of the fan 5 or at a rear of the fan 5. Considering that the longer the heated air flows, the greater the heat loss; and when the heated air blows to the fan 5, the service life of the fan 5 will be affected; therefore, the heating element 4 is preferably arranged at the front end of the air duct, and the fan 5 is preferably arranged at the rear of the heating element 4.

[0114] In addition, a shock-absorbing ring 50 is sleeved on the fan 5 to reduce the vibration effect of the fan 5 on the mounting bracket assembly and the handle 1, and to reduce vibration noise.

[0115] As an embodiment of the present application, the motor rotation mechanism includes a motor 31 fixed in the handle 1, a connecting plate 32 rotatably arranged in the front of the air duct, and a transmission assembly 33 for transmitting rotational power between the motor 31 and the connecting plate 32. Wherein, the hair curling post 2 is fixedly connected to the connecting plate 32.

[0116] In the present application, the motor 31 may be arranged in the the air duct, in front of the air duct, or at a rear of the air duct. Considering that a blocking surface

of the motor 31 to the flowing air is relatively large, the motor 31 is not suitable to be arranged in the air duct or at the front of the air duct. In addition, when the heated air blows toward the motor 31, the service life of the motor 31 will be affected; therefore, it is preferable to arrange the motor 31 at the rear of the air duct.

[0117] Furthermore, the transmission assembly 33 includes a driving gear 331 fixed to an output shaft of the motor 31, a driven gear 332 meshing with the driving gear 331, and a gear set rotating synchronously with the driven gear 332.

[0118] Specifically, the gear set includes a first gear 334 fixedly connected to the driven gear 332 through a rotating shaft 333, a second gear 336 fixedly connected to the connecting plate 32, and a third gear 335. The third gear 335 is meshing with the first gear 334 and the second gear 336 to transmit rotational power.

[0119] Furthermore, the power transmission between the motor 31 and the connecting plate 32 is not limited to the use of gears, and other transmission structures such as a transmission belt can also be used.

[0120] Considering that the hair curling post 2 needs to be fixed with the connecting plate 32, and the flowing air needs to pass through the connecting plate 32 and flow to the hair curling post 2, it is limited that the connecting plate 32 is arranged at a front port of the handle 1, and a plurality of through grooves 320 are formed on the connecting plate 32.

[0121] In a specific application scenario, since the hair curling post 2 needs to be disassembled frequently for maintenance, or it may also be necessary to install other hairdressing accessories, such as a straightening comb and a hair dryer, on the handle 1, the hair curling post 2 and the connecting plate 32 are designed to be connected in a quick-detachable manner. Specifically, a snap connection, a threaded connection, a quick-plug connection or other connection manners that can be quickly detached may be used between the hair curling post 2 and the connecting plate 32, which is not limited in this application.

[0122] The automatic hairdresser in the present application also includes a printed circuit board 6 for controlling and operating the motor rotation mechanism, the heating element 4 and the fan 5. Since the printed circuit board 6 has heating elements which will generate heat during operation; in view of this, the printed circuit board 6 is preferably arranged in the air duct, and an installation plane of the printed circuit board 6 is parallel to a flow direction of the air in the air duct. In this way, the printed circuit board 6 can block the air duct as little as possible, and at the same time, the flowing cold air can effectively reduce the temperature rise of the heating elements, thereby prolonging the service life of the elements.

[0123] Specifically, the printed circuit board 6 may be disposed between the heating element 4 and the fan 5, or may be disposed at a rear of the heating element 4 and the fan 5. Preferably, the printed circuit board 6 is disposed at the rearmost end of the air duct.

[0124] As an embodiment of the present application, the plurality of air inlet holes 10 communicating with the air duct are arranged at a rear side of the handle 1 along a circumferential direction of the handle 1. A filter screen 13 for filtering the air is disposed between the air inlet holes 10 and the air duct.

[0125] Specifically, a rear end of the mounting bracket assembly (i.e., the inlet end of the air duct) is fixedly clamped with a filter screen holder 130 for supporting the filter screen 13. A filter screen bottom plate 14 for restricting the filter screen 13 on the filter screen holder 130 is detachably provided at a rear of the filter screen holder 130.

[0126] Furthermore, a lower bottom plate 15 is detachably connected to the rear of the filter screen bottom plate 14, and the lower bottom plate 15 is configured to block a rear port of the filter screen 13.

[0127] Specifically, the filter screen bottom plate 14 is provided with a plurality of twist grooves 141, and the lower bottom plate 15 is provided with a plurality of twist buttons 151 which are configured to be correspondingly buckled with the twist grooves 141. The twist groove 141 is L-shaped. As a result, the lower bottom plate 15 can be easily detached from the filter screen bottom plate 14.

[0128] A rear bottom plate 11 is fixed at the rear port of the handle 1, and the rear bottom plate 11 is used to block the rear port of the handle 1. Wherein, the rear bottom plate 11 is provided with a first power cord opening (not shown in the drawings). The lower bottom plate 15 is provided with a plurality of rear air inlet holes 150 communicating with the air duct and a second power cord opening (not shown in the drawings).

[0129] In a specific application scenario, a power cord can pass through the first power cord opening, the second power cord opening and the filter screen holder 130 so as to be connected to the printed circuit board 6.

[0130] As an embodiment of the present application, the hair curling post 2 includes an integrally formed end shell 21 and a half-post shell assembly 22; wherein, the end shell 21 of the hair curling post 2 can be quickly detached and fixed to the connecting plate 32.

[0131] Furthermore, an outer surface of the half-post shell assembly 22 is substantially cylindrical, and includes two half-post shells 23. The two half-post shells 23 are arranged opposite to each other and form a gap 20 between the two half-post shells 23. Wherein, the two half-post shells 23 are integrally formed at a front of the end shell 21.

[0132] Specifically, each half-cylindrical shell 23 includes a ventilation cavity 230 formed therein. The end shell 21 is provided with a connecting cavity 210 which communicates with the ventilation cavities 230 and the air duct. Wherein, the air outlet portion is configured to communicate with the ventilation cavities 230. It is understandable that the cold air/hot air blown from the air duct can all flow through the connecting cavity 210, and be divided into the two ventilation cavities 230, and then be blown onto the hair from the air outlet portions ar-

ranged on the half-post shells 23.

[0133] The air outlet portion in this application includes an air outlet slot 231. The air outlet slot 231 is configured to communicate with the ventilation cavity 230, and is obliquely opened on a side of the half-post shell 23 facing the gap 20.

[0134] Referring to FIG. 11 and FIG. 12, the two air outlet slots 231 correspondingly opened on the two half-cylindrical shells 23 are symmetrically arranged with a central plane of the gap 20 as a symmetrical plane. An included angle α is formed between an inclination direction of the air outlet slot 231 and the center plane of the gap 20. Based on the above structure, when the two air outlet slots 231 blow air outward, a negative pressure area will be generated in an opposite direction of the air blowing direction. At this time, if the end of the hair is placed in the negative pressure area, the wind blown out through the air outlet slots 231 can blow the hair along the blowing direction, and then the hair can be placed in the gap 20 smoothly.

[0135] The inclination direction of the air outlet slot 231 is obliquely downward. In a specific application scenario, when the included angle α is too large, the air blown from the two air outlet slots 231 will collide, and it is not easy to create a significant negative pressure area above the gap 20. Therefore, it is limited that the included angle α should not be too large, and preferably the included angle α should be no greater than 45° .

[0136] The air outlet portion in this application also includes a plurality of air outlet holes 24. The air outlet holes 24 are configured to communicate with the ventilation cavity 230. The air outlet holes 24 are opened on a side of the half-post shell 23 facing away from the gap 20, and are configured to perform hot air styling or cold air styling on the hair wound on the hair curling post 2.

[0137] Furthermore, each front end of the two half-post shells 23 includes a chamfer 27. The two chamfers 27 form an outwardly flared opening which communicates with the gap 20. A user can place the hair in the gap 20 through the opening, and then place the hair in the gap 20 smoothly through the wind blown from the air outlet slot 231.

[0138] In addition, in the prior art, some of the existing hair curlers lack a hair clipping mechanism, and the user only relies on the winding force to fix the hair on a heating roller. In this way, the hair is easy to scatter, and it is difficult to achieve a better curly hair effect. Some other existing hair curlers are also provided with a hair clipping mechanism. The hair clipping mechanism can completely fix the end of the hair on the heating roller, so that the hair is not easily scattered. However, when more hair is clipped or the curling force is stronger, this completely fixed manner will cause the hair to have a strong sense of pinching, thereby reducing the user experience. The user needs to manually place the ends of the hair on the heating roller for fixing. Since there is no external pressure after placing, it will cause the hair to become loose after releasing the hand, which not only affects the or-

derliness of the hair curling, but also makes it difficult to achieve a better styling effect.

[0139] In view of this, in order to improve the stability of the hair being wound around the hair curling post 2, a hair clipping mechanism is provided on the hair curling post 2. The hair clipping mechanism includes two oppositely arranged clipping plate fixing plates 25, two clipping plates 26 correspondingly slidably arranged on the two clipping-plate fixing plates 25, and a spring disposed between the clipping-plate fixing plate 25 and the clipping plate 26.

[0140] Wherein, the two clipping-plate fixing plates 25 are correspondingly fixed on the sides of the two half-post shells 23 facing the gap 20. Under the action of the spring, the two clipping plates 26 can abut against each other so as to clip the hair.

[0141] Specifically, the spring is a compression spring.

[0142] Specifically, the inclination direction of the air outlet slot 231 is toward the hair clipping mechanism.

[0143] Furthermore, a recessed portion 251 is provided at a middle portion of the clipping plate fixing plate 25 toward the side of the gap 20. The end positions of the two clipping plate fixing plates 25 are abutted against each other and fixed together, so that the two recessed portions 251 constitute a placement opening for passing the hair.

[0144] An accommodating cavity 250 is provided on the clipping plate fixing plate 25. The clipping plate 26 can be retracted into the accommodating cavity 250 to expose the placement opening. In addition, when there is a lot of hair between the two clipping plates 26, the spring will be compressed, so that the hair does not have a pinch feeling, which improves the user experience.

[0145] The clipping plate 26 is provided with a guide rod 261 inserted to the clipping plate fixing plate 25 for improving the sliding stability between the clipping plate fixing plate 25 and the clipping plate 26.

[0146] As an embodiment of the present application, the hair curling post 2 is also provided with a trigger structure configured to keep the two clipping plates 26 away from each other. The trigger structure can correspondingly retract the two clipping plates 26 into the two accommodating cavities 250. After the hair has passed through the placement opening, the trigger structure is released so as to hold the hair between the two clipping plates 26.

[0147] Specifically, the trigger structure can be a mechanical structure or an automated electromechanical structure. The trigger structure can realize the function of pushing or pulling the two clipping plates 26 away from each other, which is not limited in this application.

[0148] In summary, the present application includes the fan 5 for guiding the air in the air duct, the heating element 4 for heating the air guided in the air duct, the hair curling post 2 rotatably disposed at one end of the handle 1, and the motor rotation mechanism configured to rotate the hair curling post 2. Based on the above-described structure, the hair curling post 2 can automat-

ically curl the hair, and the hair wrapped around the hair curling post 2 can be quickly styled under the action of the hot air. When the hair is styled, the fan 5 is controlled to run independently, and the air outlet portion can blow cold air to the hair, so that the hair can be quickly styled.

[0149] As shown in FIG. 13 to FIG. 20, the present application provides a hair styling appliance including: a handle 1 for an operator to hold, the handle 1 having an air duct formed inside the handle 1; a rod body 1002 disposed at one end of the handle 1, an inside the rod member 1002 being hollow to form an accommodating cavity communicating with the air duct; a first heating element 3 disposed in the accommodating cavity and configured to heat the rod body 1002; a second heating element 1004 configured to cooperate with the first heating element 3 for auxiliary heating; and a fan 5 configured to blow air. Wherein, the air duct has an inlet end and an outlet end. The handle 1 is provided with a plurality of air inlet holes 10 communicating with the inlet end of the air duct. A plurality of air outlet holes 24 are formed on an outer peripheral surface of the rod body 1002 and communicate with the outlet end of the air duct. The air outlet holes 24 communicate with the air duct through the accommodating cavity. The fan 5 makes the air flow in the air duct flow out through the air outlet holes 24 after entering the accommodating cavity.

[0150] Specifically, the rod body 1002 includes a styling state when the first heating element 3 and the second heating element 1004 are heated, and a styled state when the first heating element 3 and the second heating element 1004 are not heated.

[0151] For convenience of description, in this application, an installation direction of the rod body 1002 is defined as a front end, and an installation direction of the handle 1 is defined as a rear end.

[0152] It is understandable that the present application allows for quick styling of hair. During the quick styling process, the first heating element 3, the second heating element 1004 and the fan 5 operate together. Under the action of the fan 5, the air enters the air duct from the air inlet holes 10. The second heating element 1004 heats the air guided in the air duct, and discharges the hot air through the air outlet holes 24. At the same time, the first heating element 3 can heat the rod body 1002. In the above manner, the hair wound on the rod body 1002 can be quickly styled under the dual action of the rod body 1002 and the hot air.

[0153] When the hair is finished styling, the present application allows for quick styling of the hair. During the process of quick styling, the first heating element 3 and the second heating element 1004 stop working, that is, the fan 5 operates independently. Under the action of the fan 5, the air enters the air duct from the air inlet holes 10, and the cool air is discharged to the styled hair through the air outlet holes 24, so that the hair can be quickly styled.

[0154] As an embodiment of the present application, the rod body 1002 is substantially cylindrical, and is dis-

posed at the front end of the handle 1 in a quick-detachable manner. A sealing gasket 1023 is disposed at the connection between the rod body 1002 and the handle 1.

[0155] In a specific application scenario, the rod body 1002 and the handle 1 may adopt a snap connection, a screw connection, a quick-plug connection or other connection manners that can be quickly disassembled, which are not limited in this application.

[0156] The first heating element 3 is disposed inside the rod body 1002. The first heating element 3 includes a plurality of PTC resistor plates 1033 and a resistor plate mounting bracket 30 for mounting the PTC resistor plates 1033. In order to improve the heating efficiency of the rod body 1002, the PTC resistor plates 1033 are preferably attached to an inner wall of the rod body 1002.

[0157] Specifically, the resistor plate mounting bracket 30 includes a shaft rod 1031 arranged along a length direction of the rod body 1002 and a plurality of holders 1032 arranged on the shaft rod 1031 along a circumferential direction of the shaft rod 1031. Wherein, the holder 1032 is composed of two fixing plates 321 arranged opposite to each other. A space 322 for inserting the PTC resistor plate 1033 is formed between the two fixing plates 321.

[0158] In order to ensure that the first heating element 3 can evenly heat the rod body 1002, the number of the PTC resistor plates 1033 and the holders 1032 is defined to be multiple, and they are evenly arranged in the rod body 1002.

[0159] The more the number of PTC resistor plates 1033 is, the better the heating uniformity effect of the rod body 1002 is. However, when there are too many PTC resistor plates 1033, the air volume leading to the air outlet holes 24 will be affected. Therefore, in a specific application scenario, the number of the PTC resistor plates 1033 should be appropriate, and preferably the number is 3 to 6.

[0160] Furthermore, the holder 1032 is provided with a rear limit block 324. The rear limit block 324 is disposed at a rear of the space 322 for limiting the rear end of the PTC resistor plate 1033. A front limit block 1021 is provided in a front end of the rod body 1002. The front limit block 1021 is configured to abut against the front ends of the holder 1032 and the PTC resistor plates 1033, and is used to limit the front ends of the holder 1032 and the PTC resistor plates 1033.

[0161] Furthermore, a top cover 1022 is clamped on a front end of the rod body 1002. The top cover 1022 and the shaft rod 1031 are fixedly connected by a first fastener 221. Based on the above structure, the relative positions of the top cover 1022, the rod body 1002 and the resistor plate mounting bracket 30 can be fixed. In addition, the PTC resistor plate 1033 can be stably inserted into the space 322 under the joint limitation of the front limit block 1021, the rear limit block 324 and the inner wall of the rod body 1002.

[0162] The first fastener 221 is a bolt, a screw, a rivet or others, which is not limited in this application.

[0163] In one embodiment, in order to prevent the fixing plate 321 from bearing the heat generated by the PTC resistor plate 1033 too much, a plurality of heat sinks 323 are provided on a side of the fixing plate 321 facing away from the space 322, so that the heat dissipated by the heat sinks 323 is carried out from the air outlet holes 24 by the flowing air. It can also be understood that the plurality of heat sinks 323 are disposed on a side of the holder 1032.

[0164] Specifically, the shaft rod 1031 is provided with an air-inducing groove (not shown in the drawings) with an open rear end along its length direction. A slot 310 communicating with the air-inducing groove is disposed between two adjacent holders 1032. Based on the above structure, part of the air guided by the fan 5 can pass through the air-inducing groove and be blown toward the heat sink 323 from the slot 310. This not only effectively controls the temperature rise of the heat sink 323, but also reduces the influence of the shaft rod 1031 on the resistance of the air flow.

[0165] As an embodiment of the present application, the second heating element 1004 includes a heating wire mounting bracket 41. A ventilation cavity (not shown in the drawings) is formed inside the heating wire mounting bracket 41. A heating wire (not shown in the drawings) is wound around the ventilation cavity. The air guided by the fan 5 can all flow through the ventilation cavity. When the heating wire is energized, it can effectively heat the guided air.

[0166] Furthermore, two ends of the heating wire mounting bracket 41 are provided with a plurality of limiting plates 42 which can limit the heating wire in the ventilation cavity. As a result, the heating wire can be prevented from coming out of the heating wire mounting bracket 41, and two ends of the ventilation cavity can be in a state of air circulation.

[0167] In the specific application scenario of the present application, the number of limiting plates 42 at each end of the heating wire mounting bracket 41 is six. The limiting plates 42 are uniformly fixed to the heating wire mounting bracket 41 along a circumferential direction of the heating wire mounting bracket 41.

[0168] In one embodiment, a mounting bracket assembly 12 is fixed in the handle 1, and the air duct is formed in the mounting bracket assembly 12.

[0169] Specifically, the mounting bracket assembly 12 includes a first mounting bracket 121 and a second mounting bracket 122 which can be fastened to each other. Wherein, the first mounting bracket 121 and the second mounting bracket 122 are substantially half-cylindrical shells, and after the two are fastened together, a cylindrical shell can be formed. That is, the air duct is formed in the cylindrical shell.

[0170] In order to improve the heating efficiency of the flowing air, the second heating element 1004 is restricted to be arranged in the air duct. At the same time, in order to improve the air conduction efficiency, the fan 5 is also restricted to be arranged in the air duct.

[0171] Wherein, the second heating element 1004 may be arranged at a front of the fan 5 or at a rear of the fan 5. Considering that the longer the heated air flows, the greater the heat loss; and when the heated air blows to the fan 5, the service life of the fan 5 will be affected; therefore, the second heating element 1004 is preferably arranged at the front end of the air duct, and the fan 5 is preferably arranged at the rear of the second heating element 1004.

[0172] In addition, a shock-absorbing ring 50 is sleeved on the fan 5 to reduce the vibration effect of the fan 5 on the mounting bracket assembly 12 and the handle 1, and to reduce vibration noise.

[0173] The present application also includes a printed circuit board 6 for controlling and operating the first heating element 3, the second heating element 1004 and the fan 5. Since the printed circuit board 6 has heating elements which will generate heat during operation; in view of this, the printed circuit board 6 is preferably arranged in the air duct, and an installation plane of the printed circuit board 6 is parallel to a flow direction of the air in the air duct. In this way, the printed circuit board 6 can block the air duct as little as possible, and at the same time, the flowing cold air can effectively reduce the temperature rise of the heating elements, thereby prolonging the service life of the elements.

[0174] Specifically, the printed circuit board 6 is disposed at the rearmost end of the air duct.

[0175] As an embodiment of the present application, the hair styling appliance further includes a hair clipping plate 7. The hair clipping plate 7 is pivotally connected to the front side of the handle 1 through the plate sleeve 8 and can be pressed against the outside of the rod body 1002. The hair clipping plate 7 is configured to clip the end of a strand of hair between the hair clipping plate 7 and the rod body 1002, so that the hair can be easily wound on the rod body 1002.

[0176] In order to make the hot air/cold air blown out from the air outlet holes 24 better blow to the hair, a plurality of ventilation holes 70 are formed on the hair clipping plate 7.

[0177] Furthermore, the hair clipping plate 7 is fixedly connected with the plate sleeve 8 through a second fastener 71. An elastic member 9 for restoring the plate sleeve 8 is disposed between the handle 1 and the plate sleeve 8. It is understandable that the hair clipping plate 7 and the plate cover 8 are fixed in one piece. The elastic member 9 can bounce the hair clipping plate 7 and the plate sleeve 8, so that the hair clipping plate 7 cooperates with the rod body 1002 to clip the hair.

[0178] Wherein, the second fastener 71 is a bolt, a screw, a rivet or others, which is not limited in this application. The elastic member 9 may be a torsion spring or a compression spring. One end of the elastic member 9 is fixed on the handle 1 through a fixing seat 91.

[0179] Specifically, the plate sleeve 8 is provided with a pressing plate 81 which is convenient for opening the hair clipping plate 7.

[0180] Furthermore, rotating shafts 1011 are fixed on two sides of the handle 1 along its width direction, and the plate sleeve 8 is pivotally connected to the two rotating shafts 1011.

[0181] Specifically, the rotating shaft 1011 is fixed on the handle 1 by a third fastener 111. The third fastener 111 can pass through the handle 1 and be screwed on the mounting bracket assembly 12, so that the positions of the mounting bracket assembly 12 and the handle 1 are relatively fixed.

[0182] Wherein, the third fastener 111 is one of a bolt, a screw and a stud.

[0183] In one embodiment, the plurality of air inlet holes 10 communicating with the air duct are arranged at a rear side of the handle 1 along a circumferential direction of the handle 1. A filter screen 13 for filtering the air is disposed between the air inlet holes 10 and the air duct.

[0184] Specifically, a rear end of the mounting bracket assembly 12 (i.e., the inlet end of the air duct) is fixedly clamped with a filter screen holder 130 for supporting the filter screen 13. A filter screen bottom plate 14 for restricting the filter screen 13 on the filter screen holder 130 is detachably provided at a rear of the filter screen holder 130.

[0185] Furthermore, a lower bottom plate 15 is detachably connected to the rear of the filter screen bottom plate 14, and the lower bottom plate 15 is configured to block a rear port of the handle 1.

[0186] Specifically, the filter screen bottom plate 14 is provided with a plurality of twist grooves 141, and the lower bottom plate 15 is provided with a plurality of twist buttons 151 which are configured to be correspondingly buckled with the twist grooves 141. The twist groove 141 is L-shaped. As a result, the lower bottom plate 15 can be easily detached from the filter screen bottom plate 14.

[0187] In the present application, the lower bottom plate 15 is provided with a plurality of rear air inlet holes 150 communicating with the air duct, and a power cord opening (not shown in the drawings). The power cord can pass through the power cord opening and the filter screen holder 130 so as to be connected to the printed circuit board 6.

[0188] In summary, the present application includes the fan 5 for guiding air in the air duct, the second heating element 1004 for heating the air guided in the air duct, and the first heating element 3 for heating the rod member 1002. Based on the above structure, the hair wound on the rod body 1002 can be quickly styled under the dual action of the heated rod body 1002 and the hot air. When the hair is styled, the fan 5 is controlled to run alone, and the cold air can be blown from the air outlet holes 24 to the hair, so that the hair can be quickly styled.

[0189] As shown in FIG. 21 and FIG. 22, a hair curling device includes a handle 2001; and a styling body 2002 connected to the handle 2001. The styling body 2002 includes an outer shell 2021 for hair to be wound around. An air outlet hole 2210 is formed on the outer shell 2021. The styling body 2002 further includes a hair clipping gap

2008 disposed on an inner side of the outer shell 2021. Two sides of the hair clipping gap 2008 are respectively provided with a clipping member 2023. At least one clipping member 2023 is connected to a transmission mechanism to operably extend or retract toward the hair clipping gap 2008. By providing the hair clipping gap 2008 for holding the hair, the hair curling device can realize the flexible opening and closing of the hair clipping gap 2008 through a simple and compact transmission mechanism, without worrying about the hair slipping and causing styling failure.

[0190] Wherein, the transmission mechanism includes an inclined surface matching structure. The inclined surface matching structure operatively converts an external force acting on the hair curling device into an extension or contraction movement of the clipping member 2023 toward the hair clipping gap 2008, so that the operation of the hair curling device has flexibility.

[0191] Referring to FIG. 23 to FIG. 28, the transmission mechanism includes an operable moving bracket 2003, a support plate 2024 disposed in parallel with the clipping member 2023, a first inclined surface matching structure disposed between the moving bracket 2003 and the support plate 2024, and a second inclined surface matching structure disposed between the support plate 2024 and the clipping member 2023. The first inclined surface matching structure converts a movement of the moving bracket 2003 along a first direction into a lifting movement of the support plate 2024 relative to the styling body. The second inclined surface matching structure converts the lifting movement of the support plate 2024 into a telescopic movement of the clipping member 2023 along a second direction.

[0192] In other words, the inclined surface matching structure includes the first inclined surface matching structure disposed between the moving bracket 2003 and the support plate 2024, and the second inclined surface matching structure disposed between the support plate 2024 and the clipping member 2023. The two inclined surface matching structures both play the role of converting the direction of movement. The first inclined surface matching structure converts the movement in the first direction into a lifting movement along an extending direction of the styling body 2002. The second inclined surface matching structure converts the lifting movement into the telescopic movement in the second direction.

[0193] The present application provides two preferred embodiments of the first inclined surface matching structure, which will be described separately below.

[0194] Referring to FIG. 23 to FIG. 25, in a first preferred embodiment, the first direction is a lateral direction, and the second direction is also the lateral direction. The first direction and the second direction are separated by a longitudinal distance. The moving bracket 2003 is operable to translate in the lateral direction. A sliding rail 2004 for the relative movement of the moving bracket 2003 is fixed in the styling body 2002. Preferably, a spring (not shown in the drawings) is disposed between the

moving bracket 2003 and the sliding rail 2004. After the hair is put into the hair clipping gap 2008, the moving bracket 2003 is released, the spring moves the moving bracket 2003 relative to the sliding rail 2004 to an initial position, the support plate 2024 moves downwardly, and the clipping member 2023 moves toward a direction of the hair clipping gap 2008, so that the hair clipping gap 2008 is closed again.

[0195] The moving bracket 2003 is also provided with an operation portion 2035 for the user to operate. In this embodiment, a shell of the styling body 2002 is provided with a receiving hole 2212. The operation portion 2035 at least partially protrudes out of the shell through the receiving hole 2212, so that the user can press to move the moving bracket 2003 relative to the sliding rail 2004 in the first direction.

[0196] Referring to FIG. 25, the first inclined surface matching structure includes a first inclined portion 2031 provided on the moving bracket 2003 and a first sliding portion 2241 provided on the support plate 2024. Of course, exchanging the positions of the first inclined portion 2031 and the first sliding portion 2241 can also convert the translational movement of the moving bracket 2003 along the first direction into the vertical lifting movement of the support plate 2024.

[0197] The height of the first inclined portion 2031 decreases along the moving direction of the moving bracket 2003, so that the first sliding portion 2241 is located at a bottom position of the first inclined portion 2031 in the initial state. When the operation portion 2035 is pressed to move the moving bracket 2003, the first sliding portion 2241 climbs upward relative to the first inclined portion 2031.

[0198] The first sliding portion 2241 is an arc surface, which is beneficial to reduce sliding resistance. The first inclined portion 2031 is a straight inclined surface.

[0199] The first inclined surface matching structure further includes a limiting portion 2033. The limiting portion 2033 is disposed on the first inclined portion 2031 to prevent the first sliding portion 2241 from being separated from the first inclined portion 2031.

[0200] Referring to FIG. 26 to FIG. 28, in a second preferred embodiment, the styling body 2002 is set to extend along a longitudinal direction. The first direction is a circumferential direction around the longitudinal direction. The moving bracket 2003' is operable to rotate in the circumferential direction.

[0201] Referring to FIG. 28, the first inclined surface matching structure includes a first inclined portion 2031' provided on the moving bracket 2003' and a first sliding portion 2241 provided on the support plate 2024. Of course, exchanging the positions of the first inclined portion 2031' and the first sliding portion 2241 can also convert the translational movement of the moving bracket 2003' along the first direction into the vertical lifting movement of the support plate 2024.

[0202] The height of the first inclined portion 2031' decreases along the moving direction of the moving bracket

2003', so that the first sliding portion 2241 is located at a bottom position of the first inclined portion 2031' in the initial state. When the operation portion 2035' is pressed to move the moving bracket 2003', the first sliding portion 2241 climbs upward relative to the first inclined portion 2031'.

[0203] Wherein, the first sliding portion 2241 is an arc surface, which is beneficial to reduce sliding resistance. The first inclined portion 2031' is a spiral inclined surface.

[0204] The first inclined surface matching structure further includes a limiting portion 2033'. The limiting portion 2033' is provided on the first inclined portion 2031' to prevent the first sliding portion 2241 from being separated from the first inclined portion 2031'.

[0205] In the second embodiment, the moving bracket 2003' is a circular ring. A protruding operation portion 2035' is provided on the moving bracket 2003'. The shell of the styling body 2002 is provided with a receiving hole 2212'. The operation portion 2035' at least partially protrudes out of the shell through the receiving hole 2212', so as to facilitate the user to operate.

[0206] Referring to FIG. 23 and FIG. 26, the styling body 2002 includes an outer shell 2021 and an inner bracket 2022. In this embodiment, the outer shell 2021 is integrally formed. The hair clipping gap 2008 inside the outer shell 2021 is Y-shaped, and an opening thereof tends to decrease from the top to the bottom, so as to facilitate placing the hair. Correspondingly, the inner bracket 2022 also has a Y-shaped opening.

[0207] Referring to FIG. 25 and FIG. 28, the styling body 2002 includes a mounting sleeve 2009. The inner bracket 2022 is assembled by two half shells which are inserted into the mounting sleeve 2009.

[0208] A groove is formed inwardly on one side of the inner bracket 2022 close to the clipping member 2023, so as to accommodate the clipping member 2023 when retracted. A positioning post 2221 is arranged in the groove. The support plate 2024 is provided with a positioning hole 2026 for receiving the positioning post 2221. The positioning hole 2026 is configured in an oval shape, so that the support plate 2024 can be displaced in a longitudinal direction. The arrangement of the positioning post 2221 and the positioning hole 2026 restricts the movement direction of the support plate 2024, and only allows the support plate 2024 to move up and down in the longitudinal direction.

[0209] Referring to FIG. 24 and FIG. 25, in the first embodiment, the second inclined surface matching structure includes a second inclined portion 2243 provided on the support plate 2024 and a second sliding portion 2242 provided on the clipping member 2023. The second sliding portion 2242 is slidably matched with the second inclined portion 2243 and pushes the clipping member 2023 to translate. Of course, the positions of the second inclined portion 2243 and the second sliding portion 2242 can also be exchanged to each other to convert the lifting movement of the support plate 2024 into the translational movement of the clipping member 2023 in the second

direction.

[0210] Specifically, the second inclined portion 2243 extends from the support plate 2024 toward the clipping member 2023. The second sliding portion 2242 extends from the clipping member 2023 toward the support plate 2024. A free end of the second inclined portion 2243 is provided with a barb 2245 to prevent the second sliding portion 2242 from slipping off.

[0211] In this embodiment, the second inclined portion 2243 is inclined upwardly. That is, the second inclined portion 2243 is provided at an acute angle with respect to an ascending direction of the support plate 2024. In this way, the rising of the support plate 2024 drives the second inclined portion 2243 to rise, so that the second sliding portion 2242 slidably matched with the second inclined portion 2243 moves downwardly along the slope of the second inclined portion 2243 relatively. The second sliding portion 2242 approaches a direction of the support plate 2024 to complete a retracting action of the clipping member 2023 away from the hair clipping gap 2008.

[0212] Referring to FIG. 26 to FIG. 28, the second inclined surface matching structure in the second preferred embodiment is the same as the second inclined surface matching structure in the first embodiment, and thus will not be repeated.

[0213] In the hair curling device in the two embodiments of the present application, in the initial state, the hair clipping gap 2008 is closed. When the hair curling device needs to be used, the user operates the moving bracket 2003 (2003') through the operation portion 2035 (2035'), so that the clipping member 2023 is retracted in a direction away from the hair clipping gap 2008. The user places hair into the hair clipping gap 2008. After the hair is placed successfully, release the operation portion 2035 (2035'), so that the moving bracket 2003 (2003') moves under the action of the elastic restoring force and drives the clipping member 2023 back to the initial state; or reversely operate the moving bracket 2003 (2003'), so that the moving bracket 2003 (2003') moves in a reverse direction to drive the clipping member 2023 to return to the initial position. As a result, putting the hair is completed.

[0214] In summary, the hair curling device provided by the present application includes the hair clipping gap 2008 and the clipping member 2023 actuated by the mechanical transmission mechanism, so that the user can fix a section of the hair before curling the hair. Then, the hair is rotated around the shell 2021. Finally, the curling hair is shaped under the action of hot air, and the styling is completed under the action of cold air. Such a structure is convenient for fixing the hair and avoids the failure of the curling due to the hair slipping during the styling process.

[0215] Referring to FIG. 29 to FIG. 34, a hair curling device includes: a handle 401; a styling body 402 connected with the handle 401, the styling body 402 including an outer shell 421 for hair to be wound around, the outer shell 421 being provided with an air outlet hole 4210; and

a transmission mechanism disposed between the handle 401 and the styling body 402. The styling body 402 further includes a hair clipping gap 408 arranged on an inner side of the outer shell 421. Two sides of the hair clipping gap 408 are provided with a clipping member 423, respectively. At least one of the clipping members 423 is connected to the transmission mechanism to operably extend and retract toward the hair clipping gap 408.

[0216] The hair curling device includes the hair clipping gap 408 for holding the hair, and can realize flexible opening and closing of the hair clipping gap 408 through the simple and compact transmission mechanism. As a result, there is no need to worry about the styling failure due to slipping of the hair.

[0217] The transmission mechanism is configured as a linkage mechanism. The linkage mechanism includes a sliding member 403 and a swinging member 404. One end of the swinging member 404 is pivotally connected to the sliding member 403. The other end of the swinging member 404 is pivotally connected to the clipping member 423. The swinging member 404 converts a translational movement of the sliding member 403 in the first direction into a telescopic movement of the clipping member 423. Two ends of the swinging member 404 are pivotally connected to the sliding member 403 and the clipping member 423 respectively, so as to convert the translational movement of the sliding member 403 along the first direction into the telescopic movement of the clipping member 423. It is needless to say that the direction of the telescopic movement of the clipping member 423 is perpendicular to the first direction.

[0218] Each of the two clipping members 423 is connected with one linkage mechanism. The two linkage mechanisms share the sliding member 403. The swinging members 404 of the two linkage mechanisms are disposed on two sides of the sliding member 403, respectively. Of course, in other embodiments, one clipping member 423 can also be kept stationary, while the other clipping member 423 is connected to and driven by the linkage mechanism.

[0219] The present application provides two preferred embodiments, wherein FIG. 31 and FIG. 32 illustrate a first embodiment, and FIG. 33 and FIG. 34 illustrate a second embodiment. One of the differences between the two embodiments is that the first direction of the sliding member 403 that triggers the movement of the clipping member 423 is different.

[0220] Referring to FIG. 31 and FIG. 32, the first direction is parallel to a longitudinal axis direction of the styling body 402. Two swinging members 404 are connected to two sides of the sliding member 403, respectively. The two swinging members 404 on a same side are arranged parallel to each other. Each of the two sides of the sliding member 403 is provided with two swinging members 404. Moreover, by arranging the two swinging members 404 on the same side in parallel, it is beneficial to transmit the power of the sliding member 403 more reliably, and the balance of the sliding members 403 can also be better

maintained.

[0221] Furthermore, the linkage mechanism includes two sliding members 403. One end of the swinging member 404 is located between the two sliding members 403. The swinging member 404 and the sliding member 403 are connected by a pin. In a preferred embodiment, the swinging member 404 is clamped between the two sliding members 403. One end of the four swinging members 404 is pivotally connected to the sliding member 403 through pins.

[0222] In the above first embodiment, the sliding member 403 translates along the longitudinal axis direction of the styling body 402 to drive one end of the swinging member 404 to move in the same direction. However, the other end of the swinging member 404 is connected with the clipping member 423 and is limited by the clipping member 423 along the longitudinal axis direction. The swinging member 404 reverses the direction of movement and causes the clipping member 423 to move in the direction of extending or retracting to the hair clipping gap 408.

[0223] The clipping member 423 includes a support plate 424. The support plate 424 is connected with the linkage mechanism. In this embodiment, the support plate 424 has a connecting portion extending along the longitudinal axis direction of the styling body 402. The connecting portion and the swinging member 404 are connected by a pin.

[0224] Referring to FIG. 31 and FIG. 32, the clipping member 423 further includes a floating clipping plate 425 disposed on a side of the support plate 424 close to the hair clipping gap 408. A restoring member (not shown) is provided between the floating clipping plate 425 and the support plate 424. The elastic restoring force of the restoring member biases the floating clipping plate 425 toward the hair clipping gap 408. The arrangement of the floating clipping plate 425 enables the clipping member 423 to have a certain space for avoidance. After the hair is put into the hair clipping gap 408, if there are too many hairs, the floating clipping plate 425 can be retracted toward the support plate 424 to prevent the hair from being clipped too tightly. With this arrangement, the hair curling device can be adapted to the needs of users with different volumes of hair. In this embodiment, the floating clipping plate 425 is provided with a positioning post 426, and the support plate 424 is provided with a guide hole for receiving the positioning post 426. The restoring member is a spring which is sleeved on the positioning post 426.

[0225] Continuing to refer to FIG. 31 and FIG. 32, the styling body 402 includes an outer shell 421 and an inner bracket 422. The inner bracket 422 is recessed toward the outer shell 421 so as to form an accommodating cavity for accommodating the clipping member 423. When the clipping member 423 retracts, the support plate 424 and the floating clipping plate 425 enter the accommodating cavity. The accommodating cavity of the inner bracket 422 provides a lateral movement space for the clipping member 423 and also restricts the movement of

the clipping member 423 along the longitudinal axis direction of the styling body 402.

[0226] In this embodiment, the outer shell 421 is integrally formed. The hair clipping gap 408 of the outer shell 421 is Y-shaped, and an opening thereof tends to decrease from the top to the bottom, which facilitates placing the hair. Correspondingly, the inner bracket 422 also has a Y-shaped opening, and the inner bracket 422 is also integrally formed.

[0227] Referring to FIG. 33 and FIG. 34, a second embodiment is provided for this application. In this embodiment, the first direction is perpendicular to the longitudinal axis direction of the styling body 402. The linkage mechanism also includes an intermediate member 406 connecting the clipping member 423 and the swinging member 404. The intermediate member 406 is configured in an L shape including a generally transverse first end portion 461 and a generally longitudinal second end portion 462. The first end portion 461 is provided with a hole for a pivot shaft of the swinging member 404 to pass through. The second end portion 462 is fixedly connected with the clipping member 423.

[0228] Specifically, two ends of the swinging member 404 are respectively provided with the pivot shafts, and the two pivot shafts face opposite directions along the longitudinal axis direction of the styling body 402. The sliding member 403 is provided with a shaft hole for receiving the pivot shaft at one end of the swinging member 404. The first end portion 461 of the intermediate member 406 is provided with a shaft hole for receiving the pivot shaft of the other end of the swinging member 404. The second end portion 462 of the intermediate member 406 is fixedly connected with the clipping member 423 through a fixing member. In this embodiment, the fixing member includes a bolt and a nut matched with the bolt.

[0229] In the second embodiment, the styling body 402 also includes an outer shell 421 and an inner bracket 422. Different from the first embodiment, the inner bracket 422 is a split type, and end portions of the inner bracket 422 are provided with protruding inserts.

[0230] A mounting sleeve 409 is also provided in the styling body 402. The mounting sleeve 409 is provided with a mounting portion for receiving the inserts of the inner bracket 422, and is also provided with a mounting hole for passing through the end of the clipping member 423. In addition, the second end portion 462 of the intermediate member 406 is further provided with a limiting portion 463 abutting against the mounting sleeve 409. By providing the mounting sleeve 409, on one hand, it is beneficial to the stability of the entire set of transmission structure, and on the other hand, it also plays the role of restricting the swinging member 404 to transmit the movement in the first direction to the clipping member 423.

[0231] Referring to FIG. 33, the sliding member 403 is configured as a slider 432. A sliding rail 431 is fixedly arranged in the styling body 402. The slider 432 reciprocates in the sliding rail 431.

[0232] A free end of the slider 432 protrudes beyond the styling body 402 so as to constitute an operation portion (not shown). In a non-triggered state, the hair clipping gap 408 is in a closed state, and the free end of the slider 432 protrudes beyond the sliding rail 431. When the hair clipping gap 408 needs to be opened, the operation portion is pressed inwardly to move the slider 432 relative to the sliding rail 431 in the first direction. The swinging member 404 is pushed, and under a force that is restricted from moving in the first direction, the movement direction is changed to move the two clipping members 423 away from each other. As a result, the clipping gap 408 is opened, allowing the user to place hair into the clipping gap 408.

[0233] Referring to FIG. 33, the same as the first embodiment, the clipping member 423 includes a support plate 424 which is connected with the linkage mechanism.

[0234] The clipping member 423 further includes a floating clipping plate 425 disposed on a side of the support plate 424 close to the hair clipping gap 408. A restoring member is provided between the floating clipping plate 425 and the support plate 424. The elastic restoring force of the restoring member biases the floating clipping plate 425 toward the hair clipping gap 408. Here, the restoring member is a spring 407.

[0235] In summary, the hair curling device provided by the present application includes the hair clipping gap 408 and the clipping member 423 actuated by the mechanical transmission mechanism, so that the user can fix a section of the hair before curling the hair. Then, the hair is rotated around the outer shell 421. Finally, the curling hair is shaped under the action of hot air. Such a structure is convenient for fixing the hair and avoids the failure of the curling due to the hair slipping during the styling process.

[0236] Referring to FIG. 35 to FIG. 39, the present application provides a hair curling device, including: a handle 501; a styling body 502 movably connected with the handle 501, the styling body 502 including two half-shell assemblies 521, and the half-shell assemblies 521 being provided with air outlet holes 5210; and a transmission mechanism connected with at least one of the half-shell assemblies 521, the transmission mechanism being operable to drive at least one of the half-shell assemblies 521 to translate relative to a remaining one of the half-shell assemblies 521 so as to form an openable and closable hair clipping gap.

[0237] The hair curling device realizes relative translation of the two half-shell assemblies 521 through a simple transmission mechanism, thereby forming the openable and closable hair clipping gap. It is convenient for the placement and clipping of the hair, and there is no need to worry about the styling failure caused by the hair slipping during the curling process.

[0238] The present application provides two preferred embodiments of the transmission mechanism. In these two preferred embodiments, both the half-shell assem-

blies 521 are connected to the transmission mechanism. That is, under the driving of the transmission mechanism, the two half-shell assemblies 521 move relatively close to each other or move away from each other at the same time. When moving away from each other, the hair clipping gap becomes larger until a maximum gap is reached, and the user places the hair to be styled into the hair clipping gap. When moving close to each other, the hair clipping gap becomes smaller until it is closed, and the hair to be styled is reliably clipped, so as to proceed to a next step of the styling process.

[0239] Of course, in other not-shown embodiments, only one half-shell assembly 521 may be connected to the transmission mechanism, and the other half-shell assembly 521 may be fixed relative to the handle 501. In this way, when the transmission mechanism drives the one half-shell assembly 521 to translate relative to the handle 501, the one half-shell assembly 521 also moves close to or moves away from the other half-shell assembly 521, so that the hair clipping gap is closed or opened.

[0240] Wherein, FIG. 35 to FIG. 38 show a first embodiment, and FIG. 39 to FIG. 42 show a second embodiment, which will be described in sequence below.

[0241] Referring to FIG. 36 to FIG. 38, the transmission mechanism includes a gear structure. The gear structure is provided between the handle 501 and the half-shell assembly 521. The gear structure translates the half-shell assembly 521 relative to the handle 501 by rotation.

[0242] Specifically, the gear structure includes a motor 504, a gear 503 sleeved on the motor 504, and a rack 505 meshing with the gear 503. The rack 505 is disposed at the bottom of the half-shell assembly 521. In this embodiment, the rack 505 and the half-shell assembly 521 are integrally formed. The rotation of the gear 503 drives the rack 505 to translate, so that the half-shell assembly 521 translates relative to the handle 501.

[0243] Preferably, the gear 503 includes a driving wheel 531 and a driven wheel 533 intermeshing with the driving wheel 531. The motor 504 includes an output shaft 541. The driving wheel 531 is sleeved on the output shaft 541. In this embodiment, a total of one driving wheel 531 and three driven wheels 533 are provided. The driving wheel 531 is driven by the motor 504 to drive the driven wheel 533 to rotate. By arranging the driving wheel 531 and the driven wheel 533, and a row of racks 505 meshing with the driving wheel 531 and the driven wheel 533 are disposed on both sides of the bottom of each half-shell assembly 521, thereby ensuring the stability of the translational movement of the half-shell assembly 521.

[0244] Of course, in other embodiments, only one of the half-shell assemblies 521 may be provided with the racks 505 on both sides of the bottom, while the other half-shell assembly 521 remains stationary relative to the handle 501. Accordingly, the gear 503 includes only one driving wheel 531 and only one driven wheel 533. The driving wheel 531 is driven by the motor 504 to drive the driven wheel 533 to rotate. The driving wheel 531 and the driven wheel 533 are respectively matched with the

racks 505 on the both sides of the bottom of the half-shell assembly 521. Therefore, the motor 504 drives the driving wheel 531 to rotate, so that one half-shell assembly 521 moves close to or moves away from the other half-shell assembly 521, thereby forming the openable and closable hair clipping gap.

[0245] Referring to FIG. 37 and FIG. 38, the gear structure further includes a gear carrier 535 between the motor 504 and the gear 503. The gear carrier 535 is provided with a plurality of protruding posts 5351 for mechanically connecting with the gears 503, respectively. In this embodiment, both the driving wheel 531 and the driven wheel 533 are provided with shaft holes 532. The gear carrier 535 is provided with four protruding posts 5351. The driving wheel 531 and the driven wheel 533 are respectively sleeved on the corresponding protruding posts 5351 through the shaft holes 532. The gear carrier 535 provides stable support for the driving wheel 531 and the driven wheel 533, thereby ensuring the stability of the gear structure.

[0246] The gear carrier 535 in the gear structure is located in the handle 501 below a top plane of the handle 501. However, the driving wheel 531 and the driven wheel 533 are raised above the top plane of the handle 501. The motor 504 located in the handle 501 drives the driving wheel 531 to rotate, and the driving wheel 531 drives the driven wheel 533 to rotate. When the driving wheel 531 and the driven wheel 533 rotate, the racks 505 at the bottom of the two half-shell assemblies 521 are driven relatively close to each other or away from each other, thereby forming the openable and closable hair clipping gap.

[0247] Referring to FIG. 36, an upper end of the handle 501 is provided with a sliding slot 513. Two ends of the bottom of the half-shell assembly 521 are provided with protrusions 211. The protrusions 211 are accommodated in the sliding slot 513 and are movable along the sliding slot 513. The arrangement of the protrusions 211 and the sliding slot 513 facilitates the translational movement of the half-shell assembly 521 relative to the handle 501.

[0248] Referring to FIG. 39 to FIG. 42, in the second embodiment, the transmission mechanism includes a swinging rod structure. The swinging rod structure is arranged between the handle 501 and the half-shell assembly 521. The swinging rod structure translates the half-shell assembly 521 relative to the handle 501 by rotating.

[0249] Specifically, the swinging rod structure includes a swinging rod 506, a sliding rail 507 cooperating with the swinging rod 506, and a pivot shaft 563. The swinging rod 506 is rotatable about the pivot shaft 563. In this embodiment, a pair of sliding rails 507 are provided. The two sliding rails 507 are respectively disposed at the bottom end of the half-shell assembly 521. The swinging rod 506 is partially disposed in the handle 501. The two sliding rails 507 are respectively connected with two ends of the swinging rod 506. The pivot shaft 563 is disposed in the middle of the swinging rod 506. When the swinging

rod 506 rotates around the pivot shaft 563, two ends of the swinging rod 506 push the two sliding rails 507 to translate. When the swinging rod 506 is substantially parallel to the sliding rails 507, the two sliding rails 507 are close to each other. When the swinging rod 506 is rotated to a position perpendicular to the sliding rails 507, the two sliding rails 507 are spaced apart from each other to a maximum distance.

[0250] The present embodiment shows a situation where the swinging rod structure causes the two half-shell assemblies 521 to translate relative to each other. Of course, in an alternative embodiment, one end of the swinging rod 506 may also be connected to the pivot shaft 563, and the other end may be connected to the sliding rail 507 provided at the bottom end of one of the half-shell assemblies 521. When the swinging rod 506 rotates around the pivot shaft 563, the other end pushes the sliding rail 507 to translate, so that the half-shell assembly 521 moves close to or moves away from the other half-shell assembly 521 to form the openable and closable hair clipping gap.

[0251] Referring to FIG. 41, two ends of the swinging rod 506 are provided with upwardly protruding sliders 561, and the sliders 561 are movable in the sliding rails 507.

[0252] In conjunction with FIG. 39 and FIG. 41, the swinging rod structure further includes an operating rod 565. One end of the operating rod 565 is connected with the swinging rod 506 through the pivot shaft 563, and the other end extends out of the receiving groove 5212 of the handle 501.

[0253] The user rotates the operating rod 565 to drive the swinging rod 506 to move in a circumferential direction, so that the swinging rod 506 pushes the two sliding rails 507 closer to each other or relatively away from each other through the sliders 561 at two ends, thereby realizing the opening and closing of the hair clipping gap.

[0254] Referring to FIG. 40, an upper end of the handle 501 is provided with a sliding slot 513. The bottom end of the half-shell assembly 521 is provided with a protrusion 211. The protrusion 211 is accommodated in the sliding slot 513 and is movable along the sliding slot 513. The arrangement of the protrusion 211 and the sliding slot 513 facilitates the translational movement of the half-shell assembly 521 relative to the handle 501 on the one hand, and limits the movement direction of the sliding rail 507 in the swinging rod structure on the other hand.

[0255] In summary, in the hair curling device provided in this application, since the styling body 502 includes the two half-shell assemblies 521, through a simple and easy transmission mechanism, the openable and closable hair clipping gap is formed between the half-shell assemblies 521, so that the user can fix a section of the hair before curling the hair. Then, the hair is rotated around the closed styling body 502. Finally, the curling hair is shaped under the action of hot air, and the styling is completed under the action of cold air. Such a structure is convenient for fixing the hair and avoids the failure of

the curling due to the hair slipping during the styling process.

[0256] The above descriptions are merely the embodiments of the present application, and are not intended to limit the patent scope of the present application. All equivalent structures or equivalent process transformations made by using the contents of the description and drawings of this application, or directly or indirectly applied in other related technical fields, are similarly included in the scope of patent protection of this application.

Claims

1. An automatic hairdresser, comprising:

a handle provided with an air duct inside the handle;
a fan configured to guide air flowing in the air duct;
a heating element disposed in the air duct and configured to heat the air guided in the air duct;
a motor rotation mechanism disposed in the handle, the motor rotation mechanism comprising a connecting plate rotatably disposed at a front of the air duct; and
a hair curling post mounted to the connecting plate, the hair curling post being provided with an air outlet portion which communicates with the air duct;
wherein the hair curling post comprises two half-post shells and a gap formed between the two half-post shells, the air outlet portion comprises an air outlet slot, and the air outlet slot is obliquely opened on a side of the half-post shells facing the gap.

2. The automatic hairdresser according to claim 1, wherein the motor rotation mechanism further comprises:

a motor being fixedly provided; and
a transmission assembly configured to transmit rotational power between the motor and the connecting plate.

3. The automatic hairdresser according to claim 2, wherein the motor is disposed at a rear of the air duct.

4. The automatic hairdresser according to claim 1, wherein a clipping-plate fixing plate is provided on a side of the half-post shells facing the gap;

a clipping plate is slidably disposed on the clipping-plate fixing plate; and
wherein a spring is provided between the clipping-plate fixing plate and the clipping plate.

5. The automatic hairdresser according to claim 4, wherein the spring is a compression spring.
6. The automatic hairdresser according to claim 1, wherein the air outlet portion further comprises a plurality of air outlet holes which are opened on a side of the half-post shells facing away from the gap.
7. The automatic hairdresser according to claim 1, wherein an air inlet hole communicating with the air duct is provided on a rear side of the handle; and a filter screen is disposed between the air inlet hole and the air duct.
8. The automatic hairdresser according to claim 1, wherein the hair curling post is fastened on the connecting plate in a fast detachable manner.
9. The automatic hairdresser according to claim 1, wherein the fan is disposed in the air duct and located at a rear of the heating element.
10. The automatic hairdresser according to claim 1, further comprising a printed circuit board; wherein the printed circuit board is disposed in the air duct and located at a rear of the heating element.
11. A motor rotation mechanism, applicable to a hairdresser which comprises a handle with an air duct formed inside the handle and a hair curling post rotatably disposed at one end of the handle; wherein the motor rotation mechanism is disposed in the handle and is configured to rotate the hair curling post, the motor rotation mechanism comprises:
 - a motor fixedly disposed at a rear end of the air duct;
 - a connecting plate rotatably disposed at a front of the air duct; and
 - a transmission assembly configured to transmit rotational power between the motor and the connecting plate;
 - wherein the hair curling post is connected to the connecting plate.
12. The motor rotation mechanism according to claim 11, wherein the transmission assembly comprises:
 - a driving gear fixed on an output shaft of the motor;
 - a driven gear meshing with the driving gear; and
 - a gear set being synchronously rotatable with the driven gear;
 - wherein the connecting plate is fixed on the gear set.
13. The motor rotation mechanism according to claim 12, wherein the gear set comprises:
 - a first gear;
 - a second gear fixedly connected to the connecting plate; and
 - a third gear meshing with the first gear and the second gear.
14. The motor rotation mechanism according to claim 13, wherein a rotating shaft is fixed between the driven gear and the first gear.
15. The motor rotation mechanism according to claim 11, wherein a plurality of through grooves are formed on the connecting plate.
16. An automatic hairdresser, comprising the motor rotation mechanism of any one of claims 11 to 15.
17. The automatic hairdresser according to claim 16, further comprising a fan disposed in the air duct, and the fan being configured to guide air flowing in the air duct.
18. The automatic hairdresser according to claim 17, further comprising a heating element disposed in the air duct, the heating element being configured to heat the air guided in the air duct; wherein the fan is disposed at a rear of the heating element.
19. The automatic hairdresser according to claim 17, wherein the handle is provided with air inlet holes communicating with the air duct.
20. The automatic hairdresser according to claim 19, wherein the air inlet holes are disposed at a rear side of the handle along a circumferential direction of the handle.
21. A hair clipping mechanism, applicable to a hair curling post which comprises two half-post shells and a gap formed between the two half-post shells; wherein the hair clipping mechanism is disposed on the two half-post shells and comprises:
 - two clipping-plate fixing plates disposed oppositely;
 - two clipping plates which are correspondingly slidably disposed on the two clipping-plate fixing plates; and
 - a spring disposed between the clipping-plate fixing plate and the clipping plate;
 - wherein the two clipping-plate fixing plates are correspondingly fixed on a side of the two half-post shells facing the gap.
22. The hair clipping mechanism according to claim 21, wherein an accommodating cavity is opened on the clipping-plate fixing plate.

23. The hair clipping mechanism according to claim 21, wherein the two clipping-plate fixing plates are abutted against each other and fixed together; and a middle part of the clipping-plate fixing plate is provided with a recessed portion. 5
24. The hair clipping mechanism according to claim 21, wherein a guide rod inserted to the clipping-plate fixing plate is provided on the clipping plate. 10
25. The hair clipping mechanism according to claim 21, wherein the spring is a compression spring.
26. A hair curling post, comprising the hair clipping mechanism of any one of claims 21 to 25. 15
27. The hair curling post according to claim 26, wherein a ventilation cavity is provided in each half-post shell.
28. The hair curling post according to claim 27, wherein a side of the half-post shells facing the gap is provided with an air outlet slot arranged obliquely; and the air outlet slot is configured in communication with the ventilation cavity. 20
29. An automatic hairdresser, comprising the hair curling post of any one of claims 26 to 28. 25
30. The automatic hairdresser according to claim 29, further comprising a handle with an air duct formed inside the handle; wherein a front of the air duct is provided with a connecting plate, and the hair curling post is mounted to the connecting plate. 30
31. A hair adsorption structure, comprising:
an end shell; and
two half-post shells arranged oppositely with a gap formed between the two half-post shells; wherein the two half-post shells are integrally formed at a front of the end shell, and a side of the half-post shells facing the gap is provided with an air outlet slot arranged obliquely; an angle is formed between an inclination direction of the air outlet slot and a center plane of the gap, so that air is blown out along a height direction of the gap. 40
32. The hair adsorption structure according to claim 31, wherein a ventilation cavity communicated with the air outlet slot is provided in the half-post shell. 50
33. The hair adsorption structure according to claim 32, wherein a plurality of air outlet holes communicated with the ventilation cavity are opened on a side of the half-post shells facing away from the gap. 55
34. The hair adsorption structure according to claim 31, wherein a front end of each of the half-post shells is provided with a chamfer; two chamfers are configured as an outwardly expanding opening which communicates with the gap.
35. The hair adsorption structure according to claim 31, wherein a clipping-plate fixing plate is provided on a side of the half-post shells facing the gap;
a clipping plate is slidably disposed on the clipping-plate fixing plate; and
wherein a spring is provided between the clipping-plate fixing plate and the clipping plate.
36. The hair adsorption structure according to claim 35, wherein the spring is a compression spring.
37. An automatic hairdresser, comprising the hair adsorption structure of any one of claims 31 to 36.
38. The automatic hairdresser according to claim 37, further comprising a handle with an air duct formed inside the handle;
wherein the air duct is configured to communicate with the air outlet slot; and a heating element and a fan are installed in the air duct.
39. The automatic hairdresser according to claim 38, wherein a front of the air duct is rotatably provided with a connecting plate; and the end shell is mounted to the connecting plate.
40. The automatic hairdresser according to claim 39, wherein a motor is fixed in the handle; and rotational power is transmitted between the motor and the connecting plate through a transmission assembly.
41. A hair styling appliance, comprising:
a handle for an operator to hold, the handle having an air duct formed inside the handle;
a rod member disposed at one end of the handle, an inside the rod member being hollow to form an accommodating cavity communicating with the air duct, an air outlet hole being formed on an outer peripheral surface of the rod member, the air outlet hole communicating with the air duct through the accommodating cavity;
a first heating element disposed in the accommodating cavity and configured to heat the rod member;
a fan disposed in the air duct; the fan being configured to blow air, so that an air flow in the air duct flows out through the air outlet hole after entering the accommodating cavity; and
a second heating element disposed in the air

- duct and configured to assist heating in cooperation with the first heating element;
wherein the rod member comprises a styling state when the first heating element and the second heating element are heated, and a styled state when the first heating element and the second heating element are not heated.
42. The hair styling appliance according to claim 41, wherein the first heating element comprises a plurality of PTC resistive plates and a resistor plate mounting bracket for mounting the PTC resistive plates; and
wherein the PTC resistor plates are disposed in close contact with an inner wall of the rod member.
43. The hair styling appliance according to claim 42, wherein the resistor plate mounting bracket comprises:
a shaft; and
a plurality of holders arranged on the shaft along a circumferential direction of the shaft;
wherein a space is formed between the holders, and the PTC resistor plate is inserted in the space.
44. The hair styling appliance according to claim 43, wherein a side of the holders is provided with a plurality of heat sinks.
45. The hair styling appliance of any one of claims 42 to 44, wherein the number of the PTC resistive plates is three.
46. The hair styling appliance according to claim 41, wherein the second heating element comprises:
a heating wire mounting bracket having a ventilation cavity inside the heating wire mounting bracket; and
a heating wire wound around the ventilation cavity;
wherein an end of the heating wire mounting bracket is provided with a limiting plate, so as to limit the heating wire in the ventilation cavity.
47. The hair styling appliance according to claim 41, wherein the handle is provided with a plurality of air inlet holes communicating with the air duct; and
wherein the air inlet holes are arranged on a rear side of the handle along a circumferential direction of the handle.
48. The hair styling appliance according to claim 41, wherein the second heating element and the fan are both disposed in the air duct; and
wherein the fan is disposed at a rear of the second
- heating element.
49. The hair styling appliance according to claim 48, further comprising a printed circuit board;
wherein the printed circuit board is disposed in the air duct and at the rear of the second heating element.
50. The hair styling appliance according to claim 41, further comprising a hair clipping plate configured to be pressed against an outside of the rod member, the hair clipping plate being pivotally connected to a front side of the handle through a plate sleeve;
wherein an elastic member for resetting the plate sleeve is arranged between the handle and the plate sleeve.
51. A hair curling device, comprising:
a handle;
a styling body connected with the handle, the styling body comprising an outer shell for hair to be wound around, the outer shell being provided with an air outlet hole; and
a transmission mechanism disposed between the handle and the styling body;
wherein the styling body further comprises a hair clipping gap arranged on an inner side of the outer shell; two sides of the hair clipping gap are provided with a clipping member, respectively; and at least one of the clipping members is connected to the transmission mechanism; and
wherein the transmission mechanism comprises an inclined surface matching structure to realize expansion or reverse contraction of the hair clipping gap.
52. The hair curling device according to claim 51, wherein the transmission mechanism comprises an operable moving bracket, a support plate disposed in parallel with the clipping member, a first inclined surface matching structure disposed between the moving bracket and the support plate, and a second inclined surface matching structure disposed between the support plate and the clipping member; the first inclined surface matching structure converts a movement of the moving bracket along a first direction into a lifting movement of the support plate relative to the styling body; and the second inclined surface matching structure converts the lifting movement of the support plate into a telescopic movement of the clipping member along a second direction.
53. The hair curling device according to claim 52, wherein the first direction is a lateral direction, the moving bracket is operable to translate in the lateral direction, and a sliding rail for a relative movement of the moving bracket is fixed in the styling body.

54. The hair curling device according to claim 52, wherein the styling body extends in a longitudinal direction, the first direction is a circumferential direction around the longitudinal direction, and the moving bracket is operatively rotatable in the circumferential direction. 5
55. The hair curling device according to claim 52, wherein the first inclined surface matching structure comprises a first inclined portion provided on one of the moving bracket and the support plate, and a first sliding portion provided on a remaining one of the moving bracket and the support plate; the first sliding portion is slidably matched with the first inclined portion; and a height of the first inclined portion decreases along a moving direction of the moving bracket. 10
56. The hair curling device according to claim 55, wherein the first sliding portion is an arc surface, and the first inclined portion is a straight inclined surface or a spiral inclined surface. 20
57. The hair curling device according to claim 55, wherein the first inclined surface matching structure further comprises a limiting portion, and the limiting portion is disposed on an upper end of the first inclined portion so as to prevent the first sliding portion from being separated from the first inclined portion. 25
58. The hair curling device according to claim 52, wherein the second inclined surface matching structure comprises a second inclined portion provided on one of the support plate and the clipping member, and a second sliding portion provided on a remaining one of the support plate and the clipping member; the second sliding portion is slidably matched with the second inclined portion and pushes the clipping member to translate. 30
59. The hair curling device according to claim 58, wherein the second inclined portion extends from the support plate toward the clipping member, the second sliding portion extends toward the support plate from the clipping member, and a free end of the second inclined portion is provided with a barb to prevent the second sliding portion from slipping off. 35
60. The hair curling device according to claim 52, wherein an operation portion is provided on the moving bracket, and the operation portion exposes the outer shell of the styling body for operation. 40
61. A hair curling device, comprising:
a handle;
a styling body connected with the handle, the styling body comprising an outer shell for hair to be wound around, the outer shell being provided with an air outlet hole; and 45
- a transmission mechanism disposed between the handle and the styling body;
wherein the styling body further comprises a hair clipping gap arranged on an inner side of the outer shell; two sides of the hair clipping gap are provided with a clipping member, respectively; and at least one of the clipping members is connected to the transmission mechanism; and wherein the transmission mechanism is configured as a linkage mechanism to realize expansion or reverse contraction of the hair clipping gap. 50
62. The hair curling device according to claim 61, wherein the linkage mechanism comprises a sliding member and a swinging member, one end of the swinging member is pivotally connected to the sliding member, another end of the swinging member is pivotally connected to the clipping member, and the swinging member converts a translational movement of the sliding member in a first direction into a telescopic movement of the clipping member. 55
63. The hair curling device according to claim 62, wherein two linkage mechanisms are provided, each clipping member is connected with one linkage mechanism, the two linkage mechanisms share the sliding member, and the swinging members of the two linkage mechanisms are arranged on two sides of the sliding member, respectively. 60
64. The hair curling device according to claim 63, wherein the first direction is parallel to a longitudinal axis direction of the styling body, two swinging members are respectively connected on two sides of the sliding member, and the two swinging members on a same side are arranged parallel to each other. 65
65. The hair curling device according to claim 64, wherein the linkage mechanism comprises two sliding members, one end of the swinging member is located between the two sliding members, and the swinging piece and the sliding piece are connected by a pin. 70
66. The hair curling device according to claim 63, wherein the first direction is perpendicular to a longitudinal axis direction of the styling body, the linkage mechanism further comprises an intermediate member connecting the clipping member and the swinging member, the intermediate member is configured in an L shape having a first end portion extending generally laterally and a second end portion extending generally longitudinally, the first end portion is provided with a hole through which a pivot shaft of the swinging member passes, and the second end portion is fixedly connected with the clipping member. 75

67. The hair curling device according to claim 63, wherein the sliding member is configured as a slider, a sliding rail is fixedly arranged in the styling body, and the slider reciprocates in the sliding rail.
68. The hair curling device according to claim 67, wherein a free end of the slider protrudes beyond the styling body so as to be configured as an operation portion.
69. The hair curling device according to claim 61, wherein the clipping member comprises a support plate connected to the linkage mechanism.
70. The hair curling device according to claim 69, wherein the clipping member further comprises a floating clipping plate disposed on one side of the support plate adjacent to the hair clipping gap, a restoring member is disposed between the floating clipping plate and the support plate, and an elastic restoring force of the restoring member biases the floating clipping plate in a direction adjacent to the hair clipping gap.
71. A hair curling device, comprising:
- a handle;
 - a styling body movably connected with the handle, the styling body comprising two half-shell assemblies, and the half-shell assemblies being provided with air outlet holes; and
 - a transmission mechanism connected with at least one of the half-shell assemblies, the transmission mechanism being operable to drive at least one of the half-shell assemblies to translate relative to a remaining one of the half-shell assemblies so as to form an openable and closable hair clipping gap.
72. The hair curling device according to claim 71, wherein the transmission mechanism comprises a gear structure, and the gear structure translates the half-shell assemblies relative to the handle by rotating.
73. The hair curling device according to claim 72, wherein the gear structure comprises a motor, a gear sleeved on the motor and a rack intermeshing with the gear; and the rack is disposed at a bottom of at least one of the half-shell assemblies.
74. The hair curling device according to claim 73, wherein the gear comprises a driving wheel and a driven wheel intermeshing with the driving wheel, the motor comprises an output shaft, and the driving wheel is sleeved on the output shaft.
75. The hair curling device according to claim 73, wherein the gear structure further comprises a gear carrier between the motor and the gear, and the gear carrier
- is provided with a protruding post for mechanical connection with the gear.
76. The hair curling device according to claim 71, wherein the transmission mechanism comprises a swinging rod structure, and the swinging rod structure translates the half-shell assemblies relative to the handle by rotating.
77. The hair curling device according to claim 76, wherein the swinging rod structure comprises a swinging rod, a sliding rail cooperating with the swinging rod, and a pivot shaft; and the swinging rod is rotatable around the pivot shaft.
78. The hair curling device according to claim 77, wherein a protruding slider is provided at a free end of the swinging rod, the sliding rail is disposed at a bottom end of at least one of the half-shell assemblies, and the slider moves within the sliding rail.
79. The hair curling device according to claim 77, wherein the swinging rod structure further comprises an operating rod; one end of the operating rod is connected with the swinging rod through the pivot shaft, and another end of the operating rod extends out of a receiving groove of the handle.
80. The hair curling device as claimed in claim 71, wherein an upper end of the handle is provided with a sliding slot, a bottom end of the half-shell assemblies is provided with a protrusion, and the protrusion is received in the sliding slot and movable along the sliding slot.

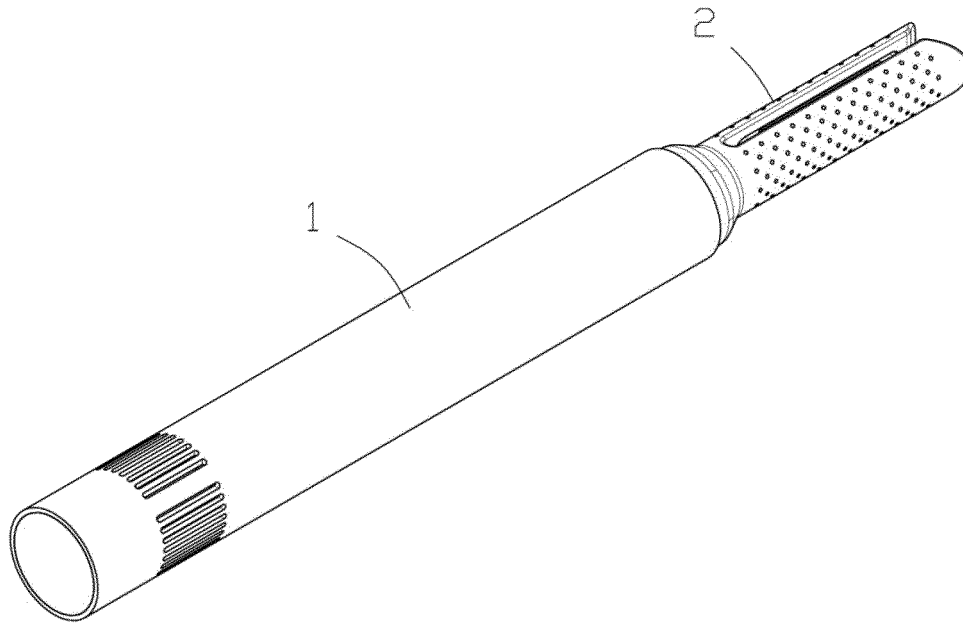


FIG. 1

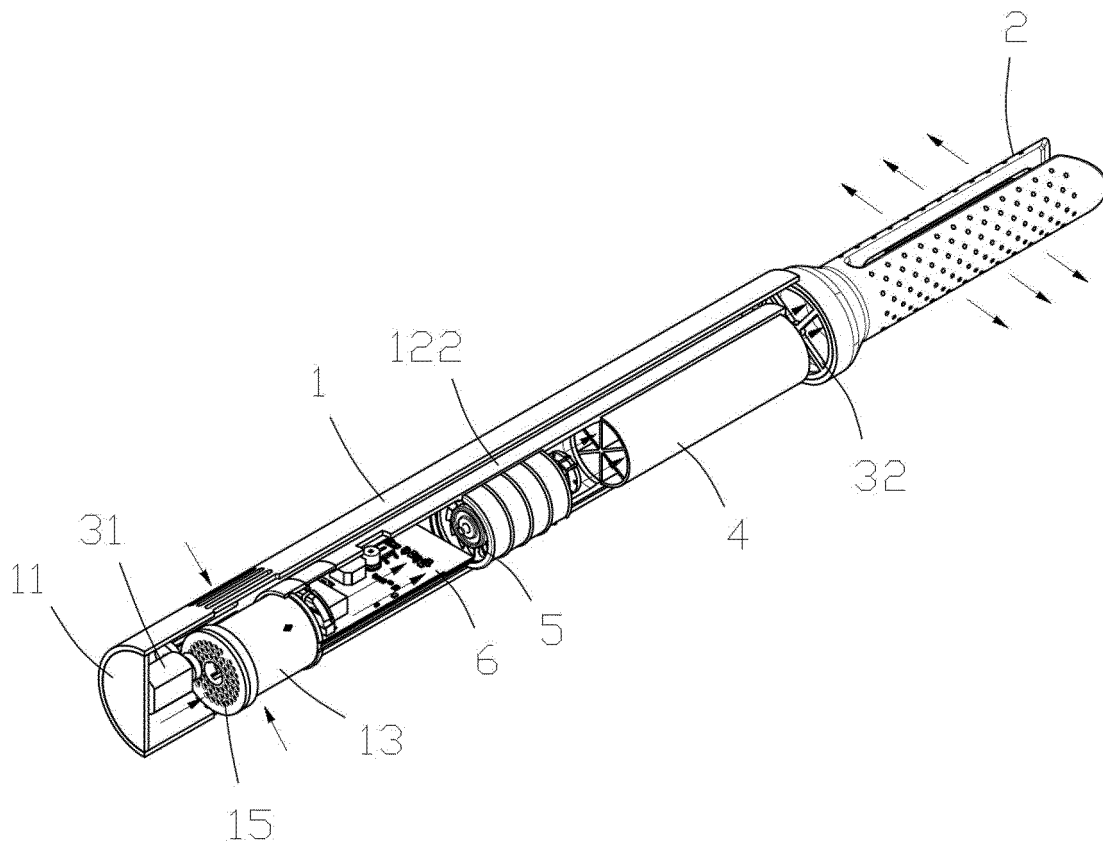


FIG. 2

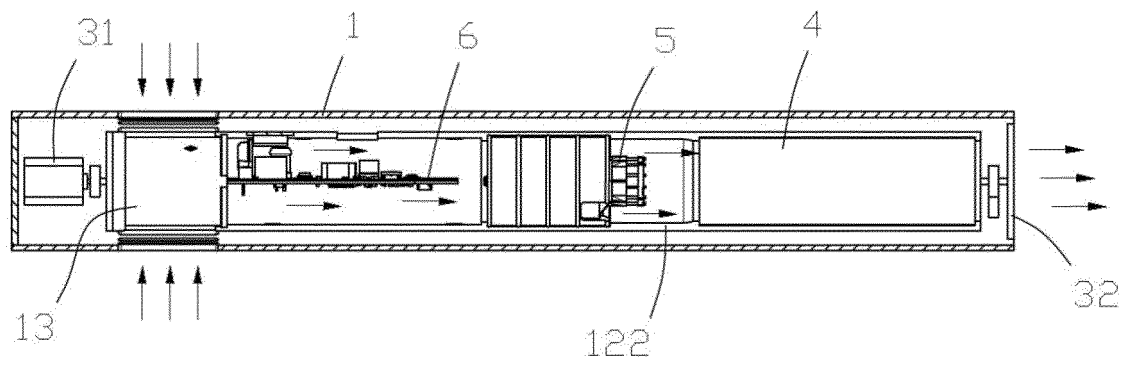


FIG. 3

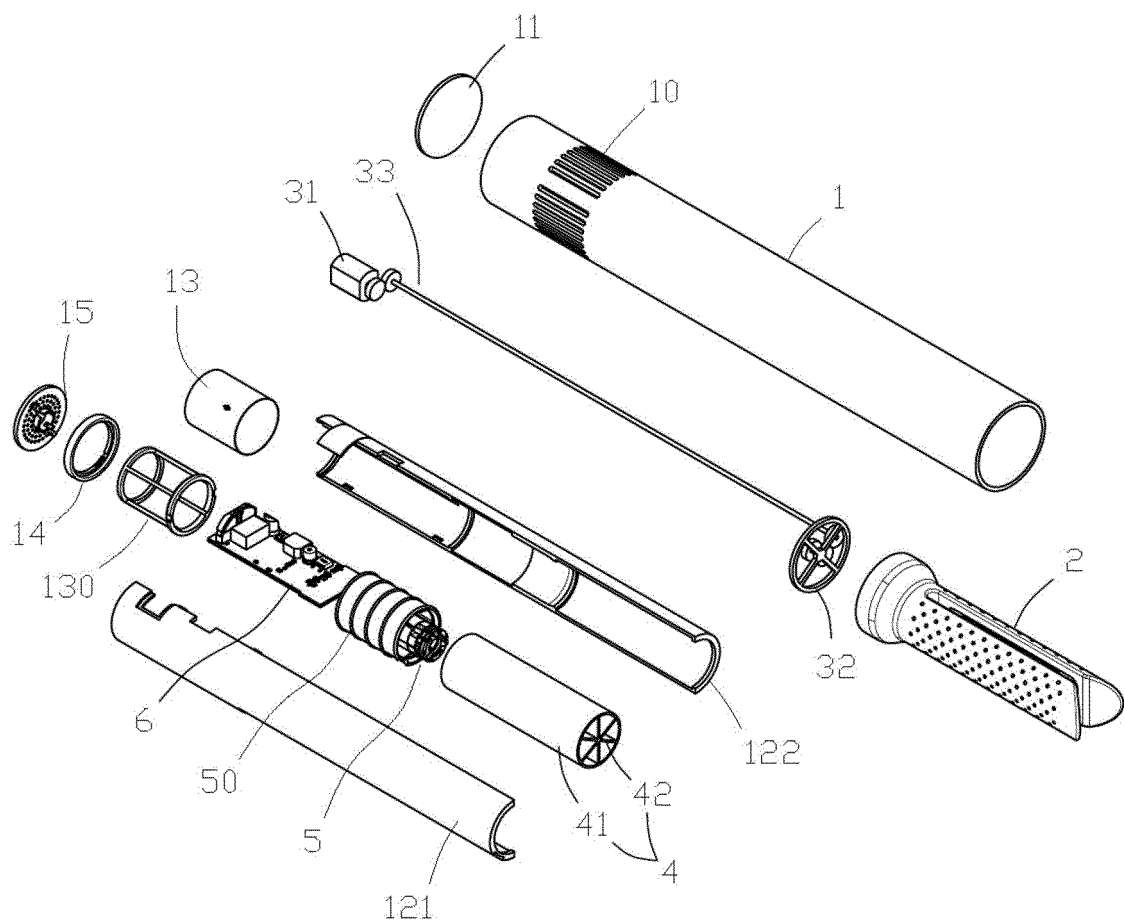


FIG. 4

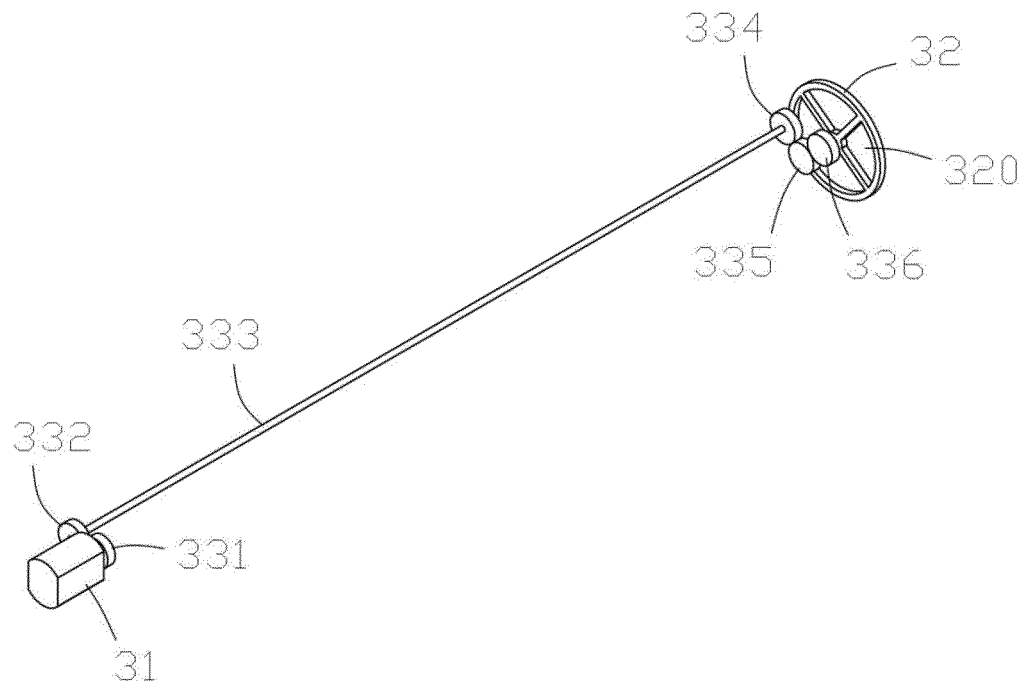


FIG. 5

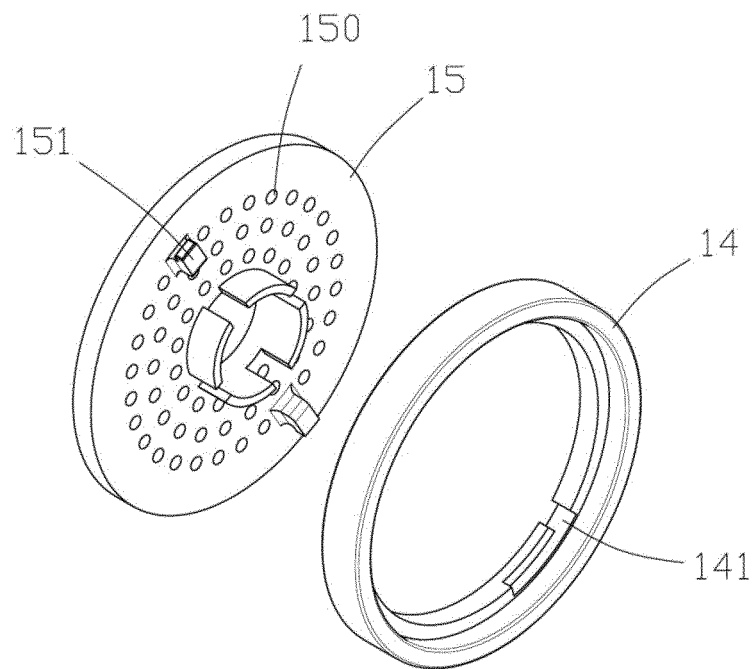


FIG. 6

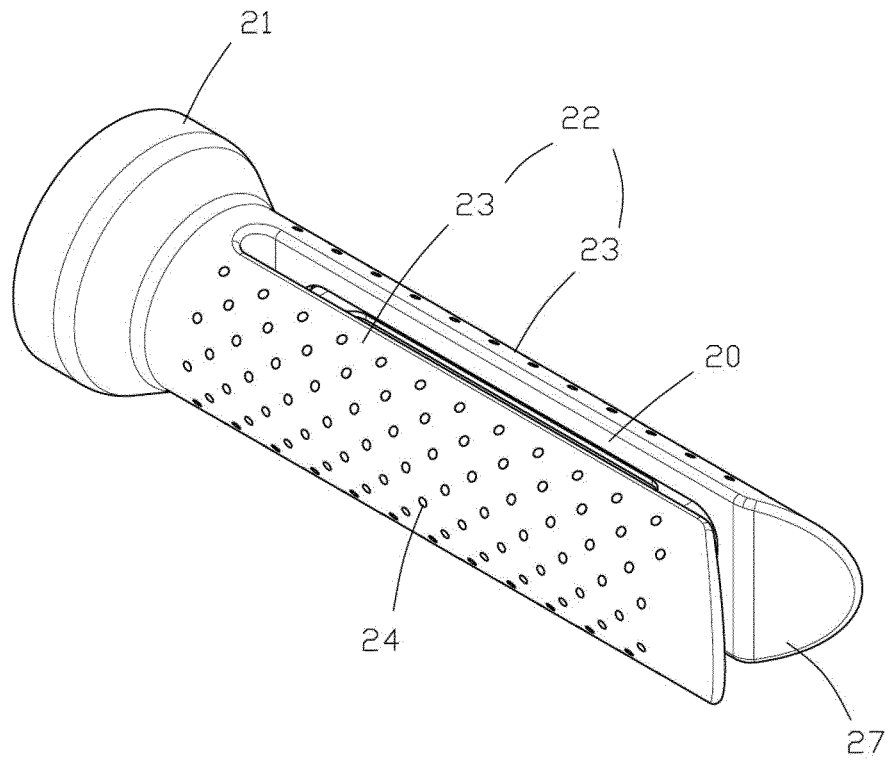


FIG. 7

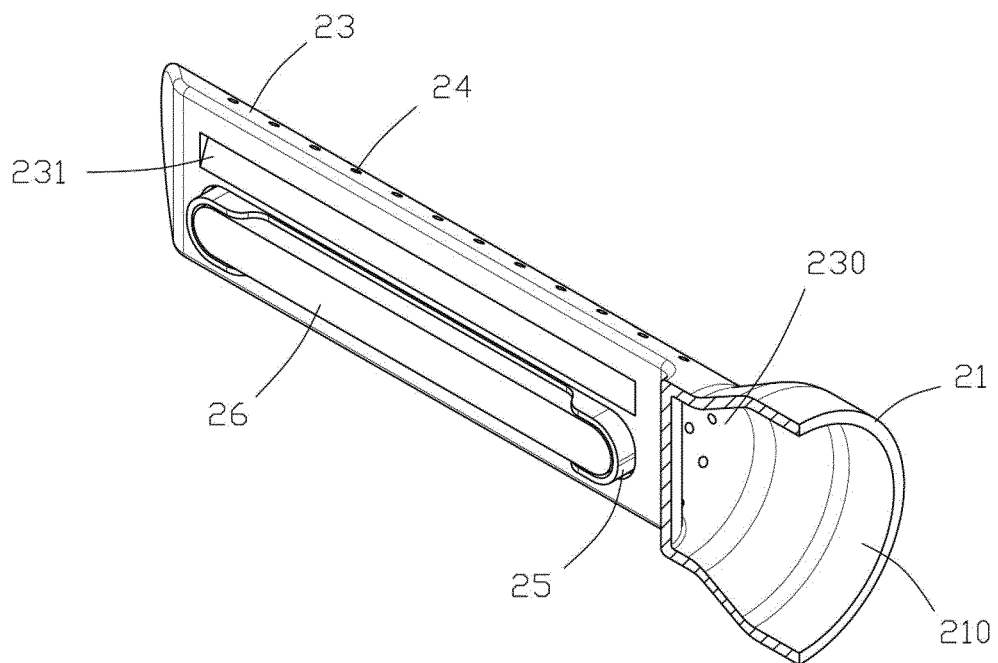


FIG. 8

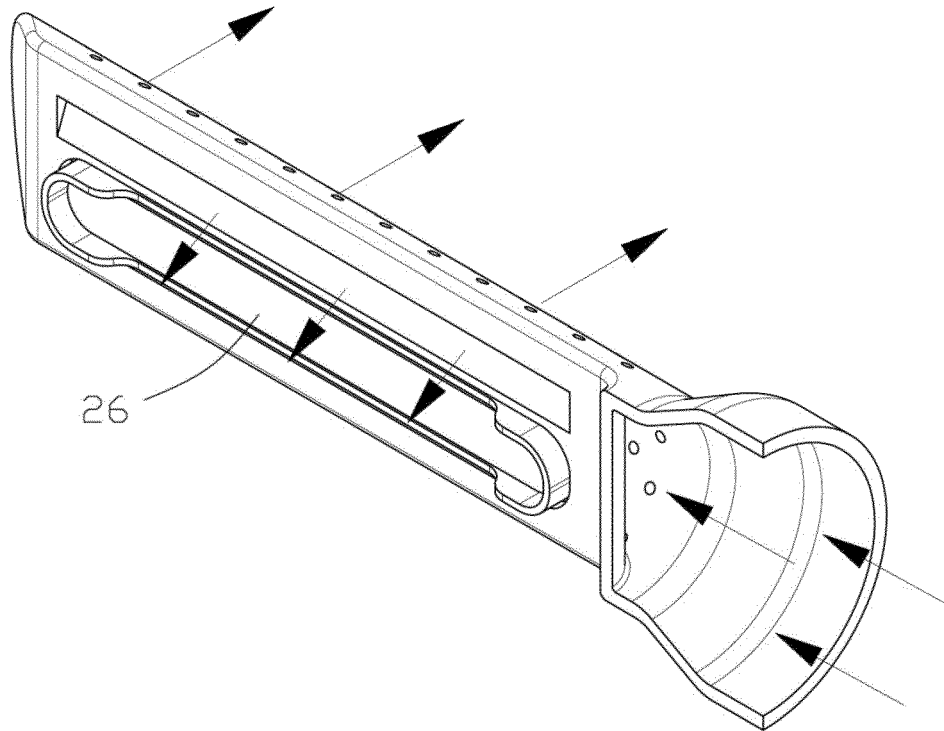


FIG. 9

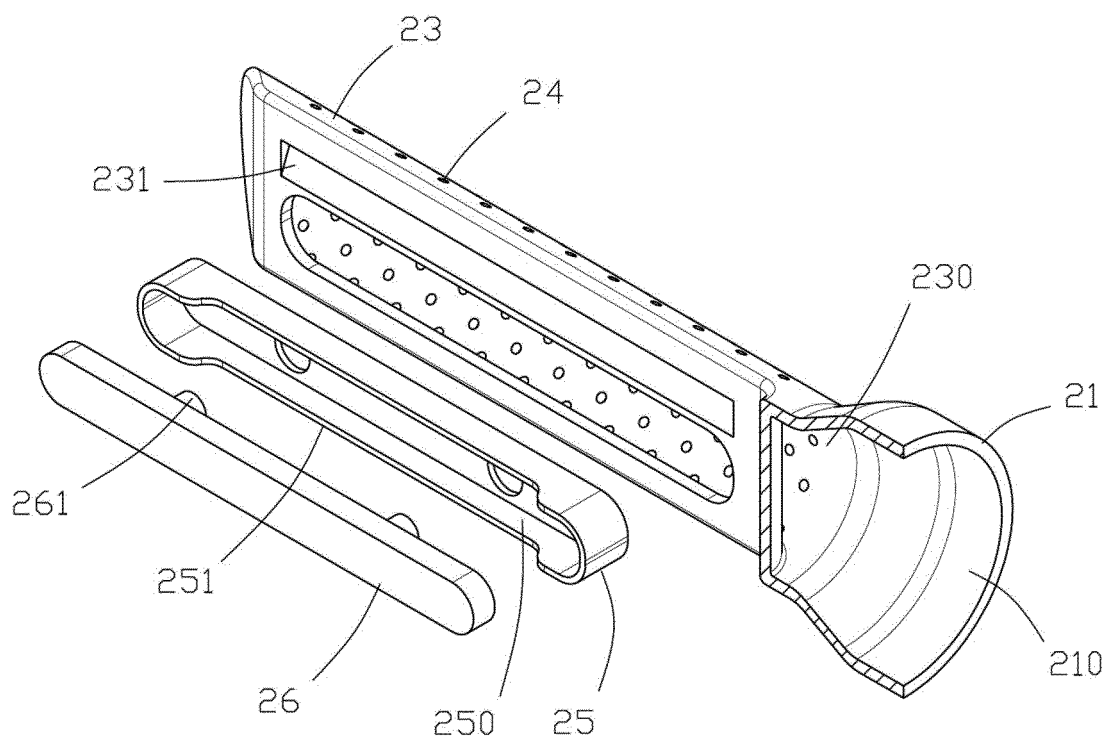


FIG. 10

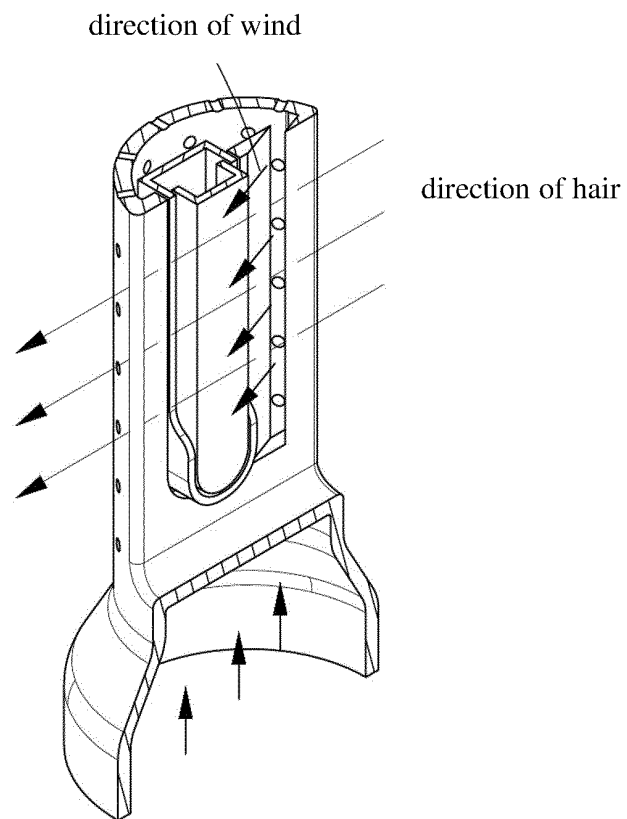


FIG. 11

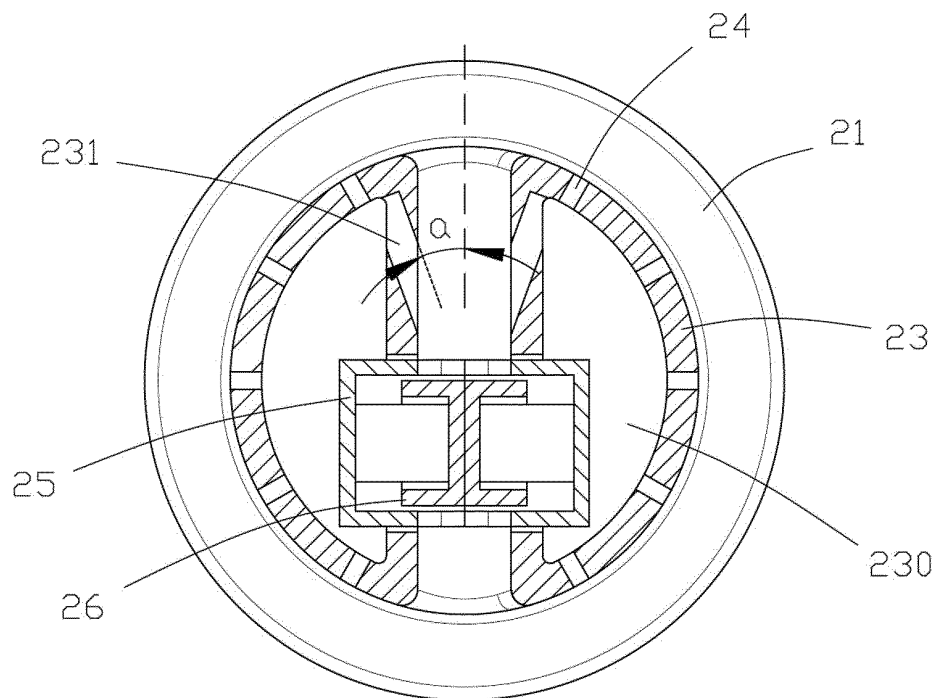


FIG. 12

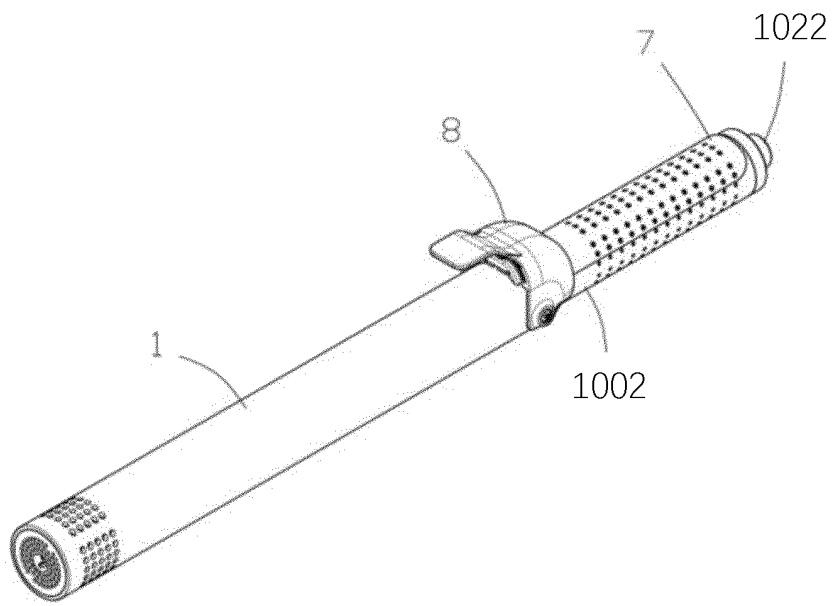


FIG. 13

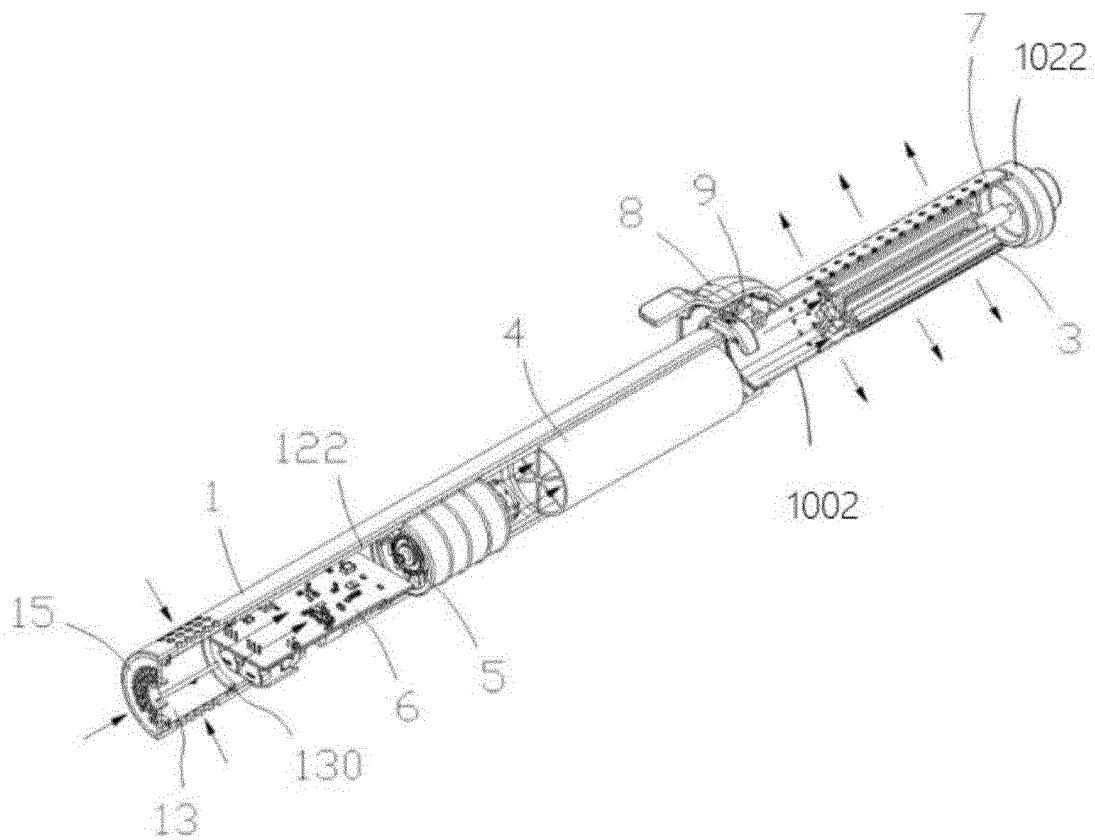


FIG. 14

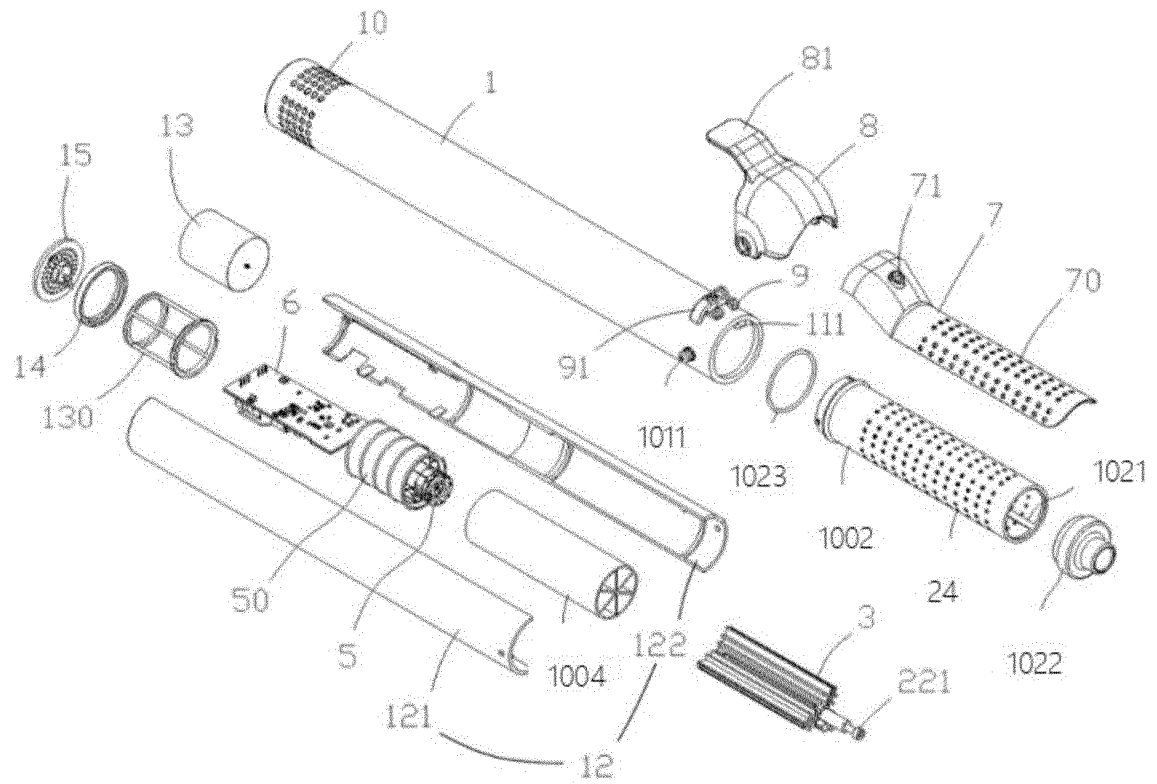


FIG. 15

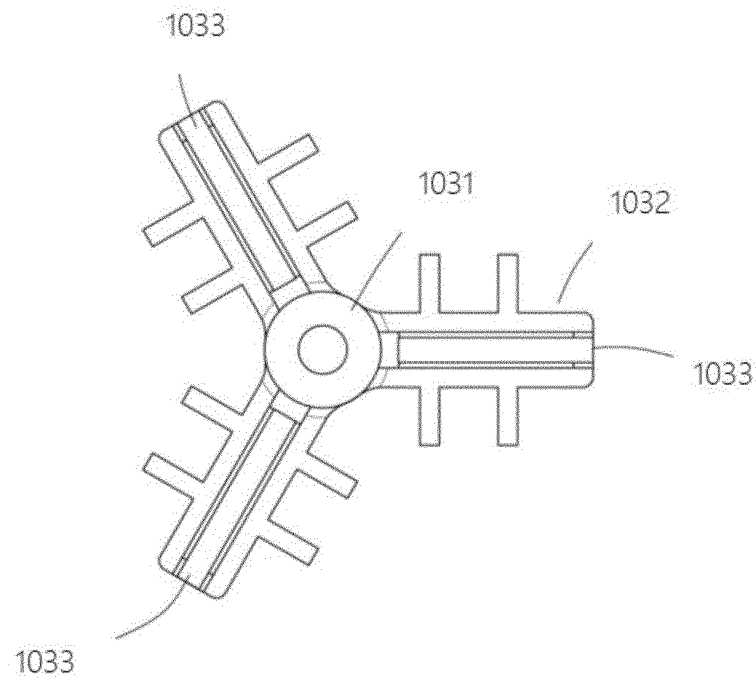


FIG. 16

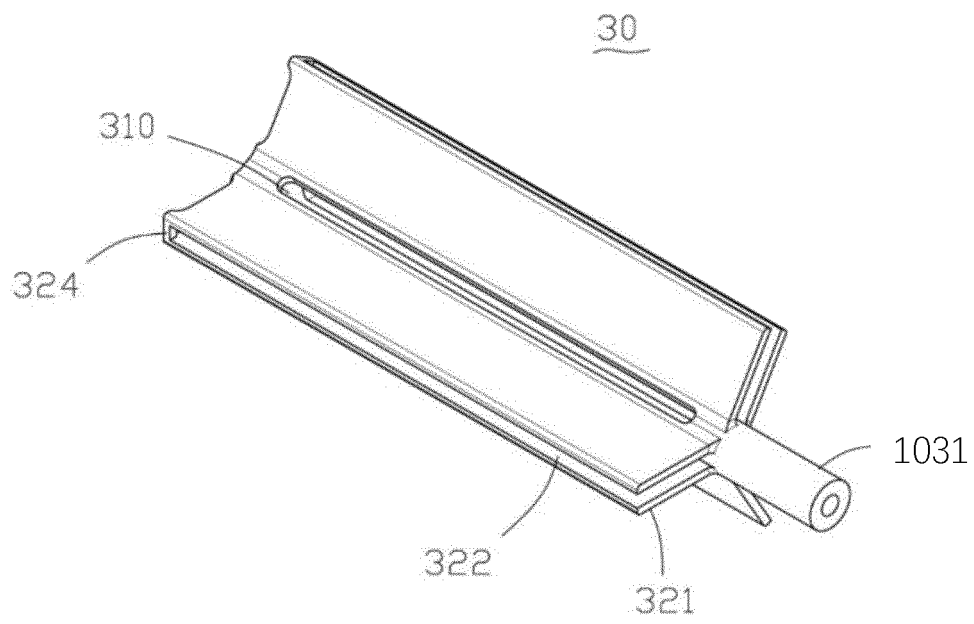


FIG. 17

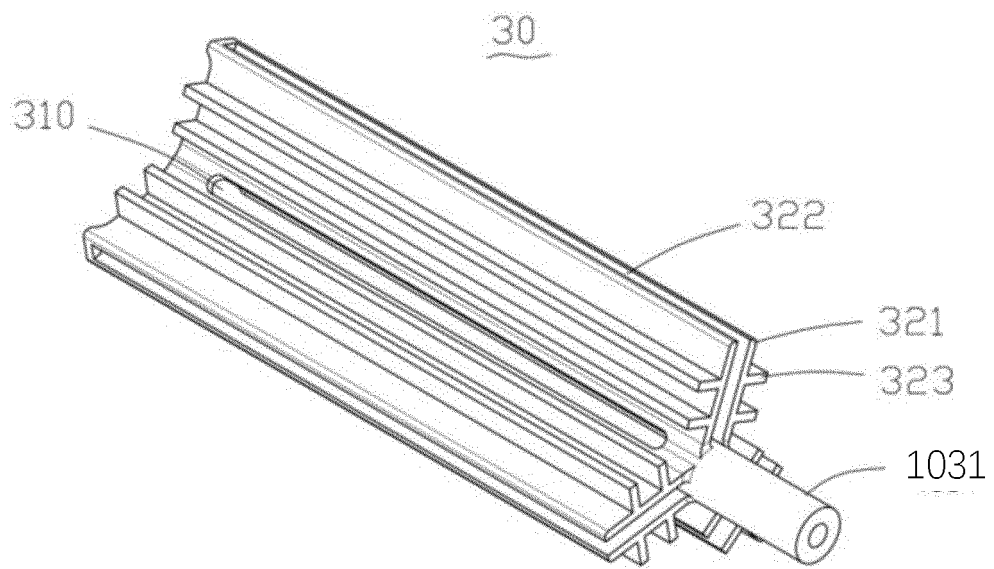


FIG. 18

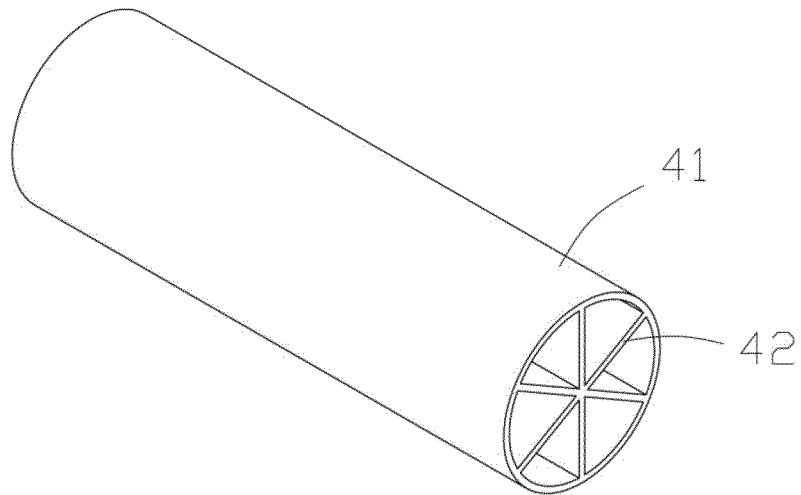


FIG. 19

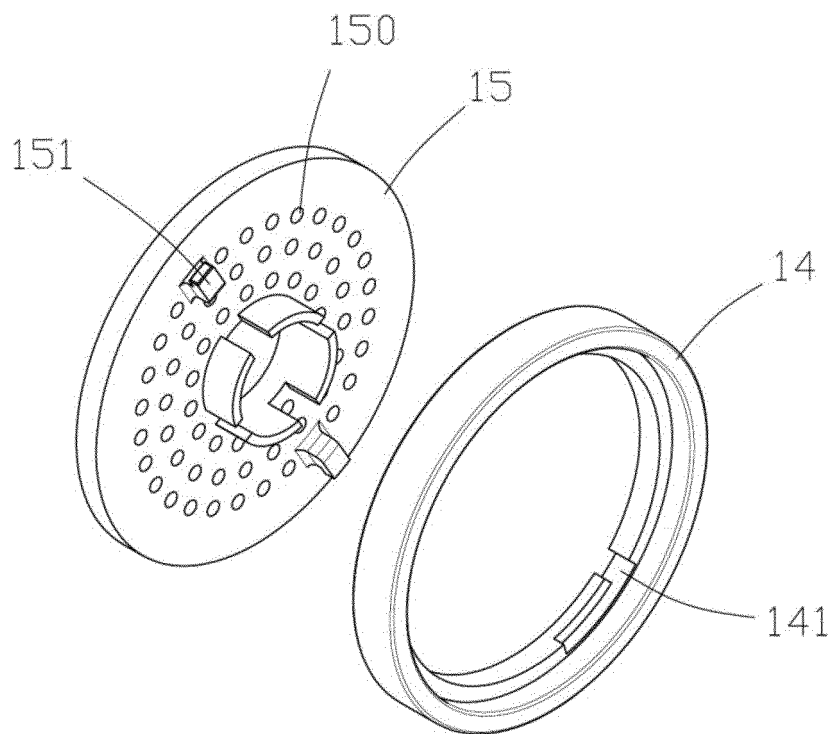


FIG. 20

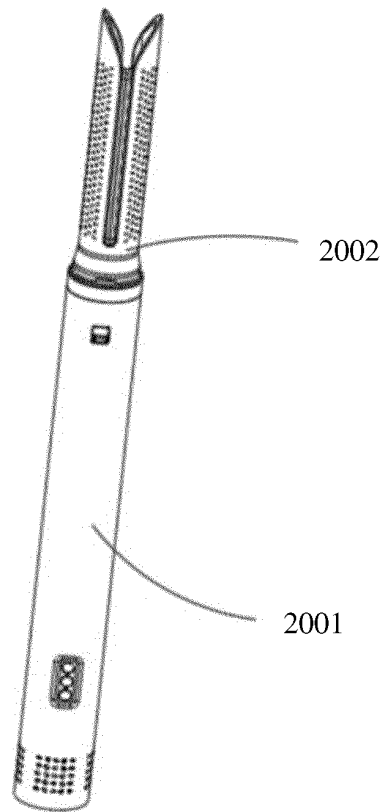


FIG. 21

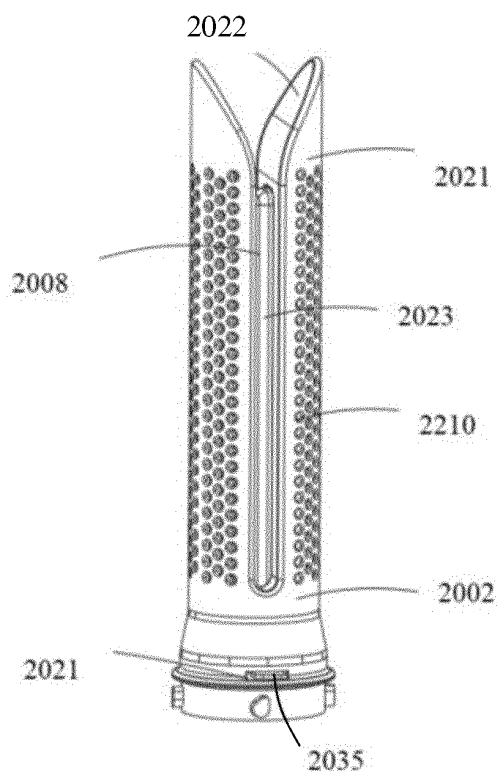


FIG. 22

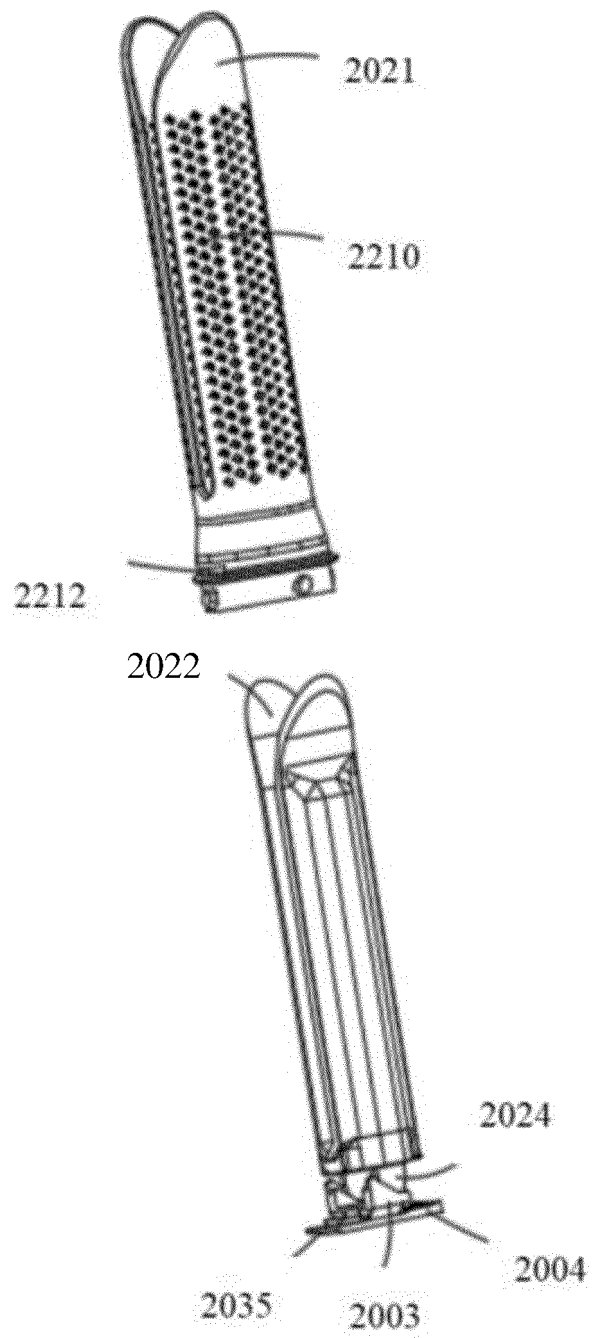


FIG. 23

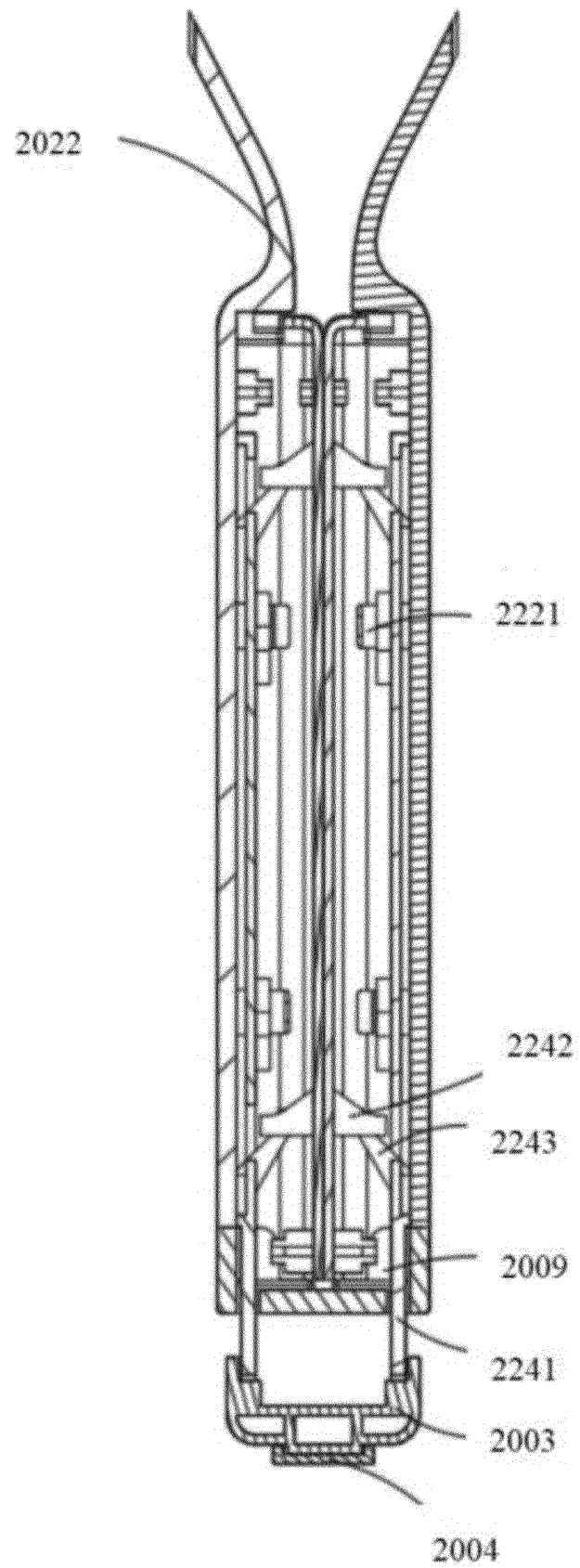


FIG. 24

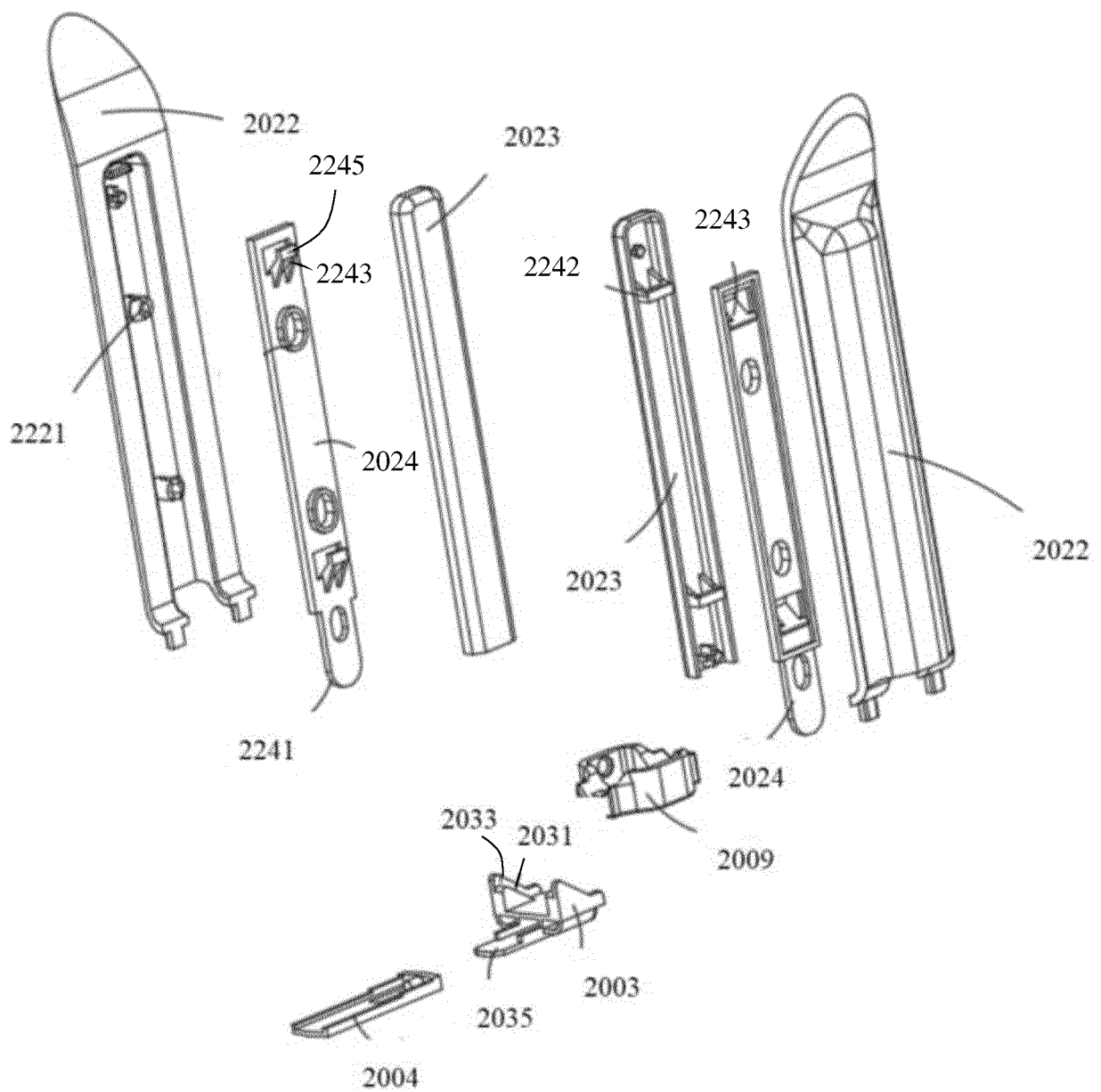


FIG. 25

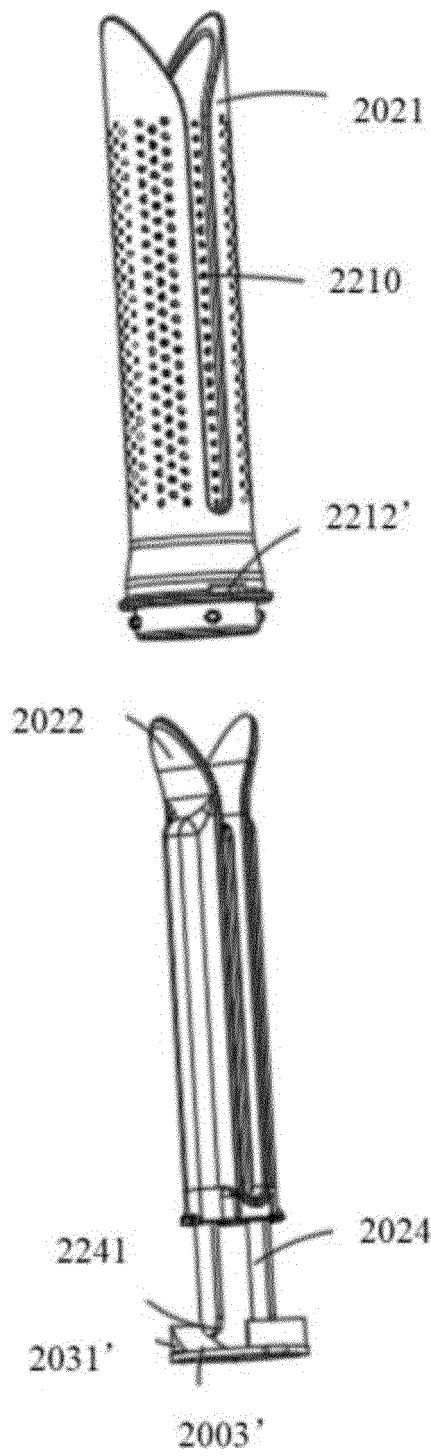


FIG. 26

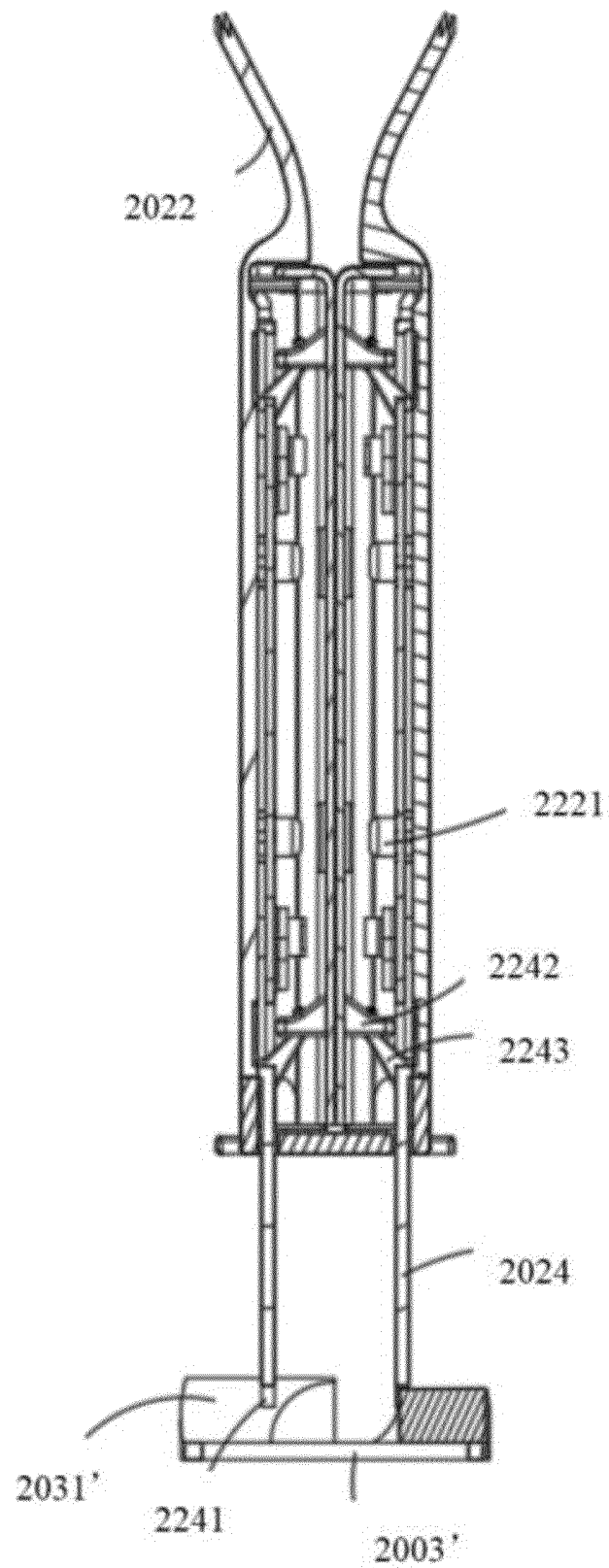


FIG. 27

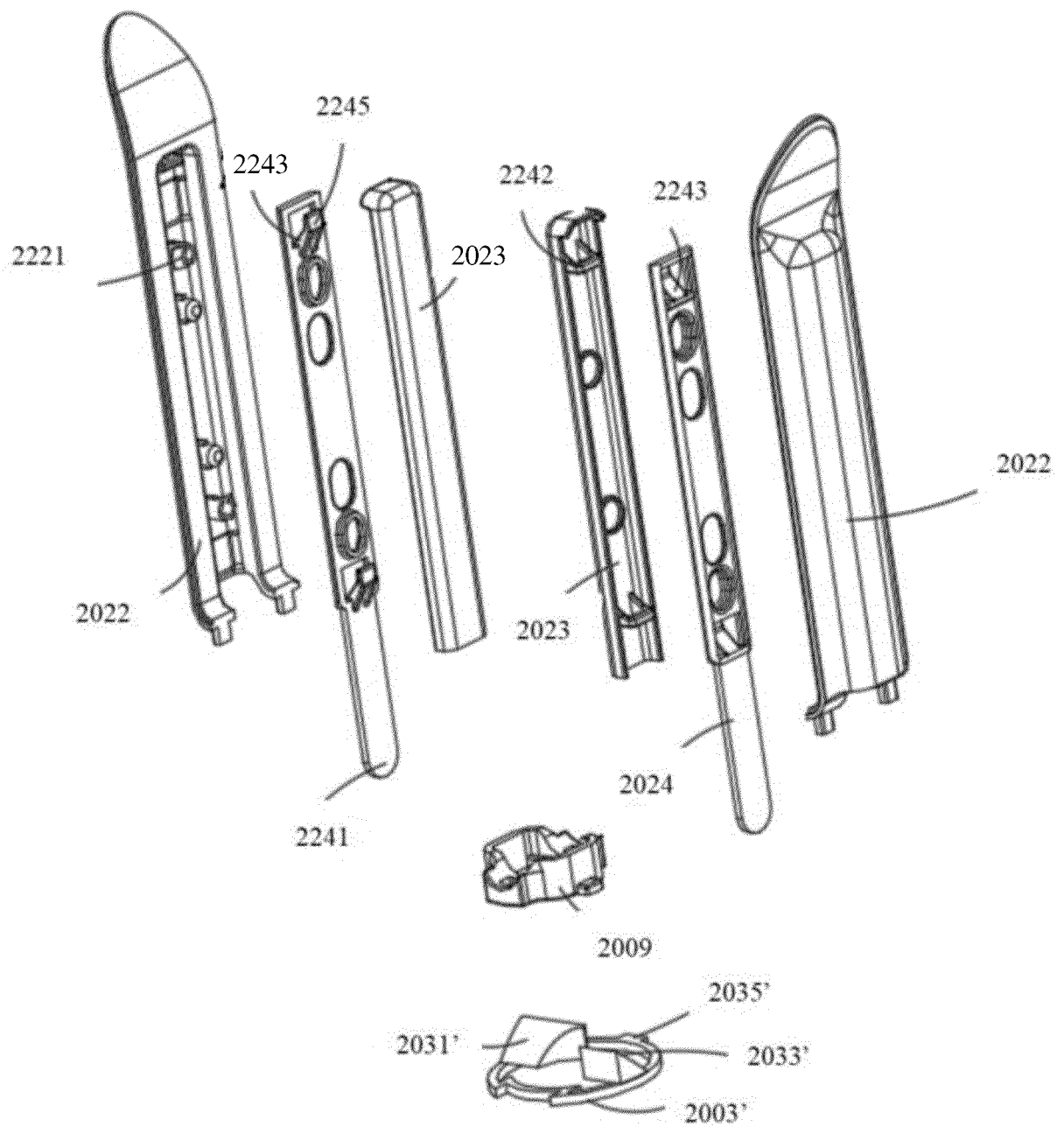


FIG. 28

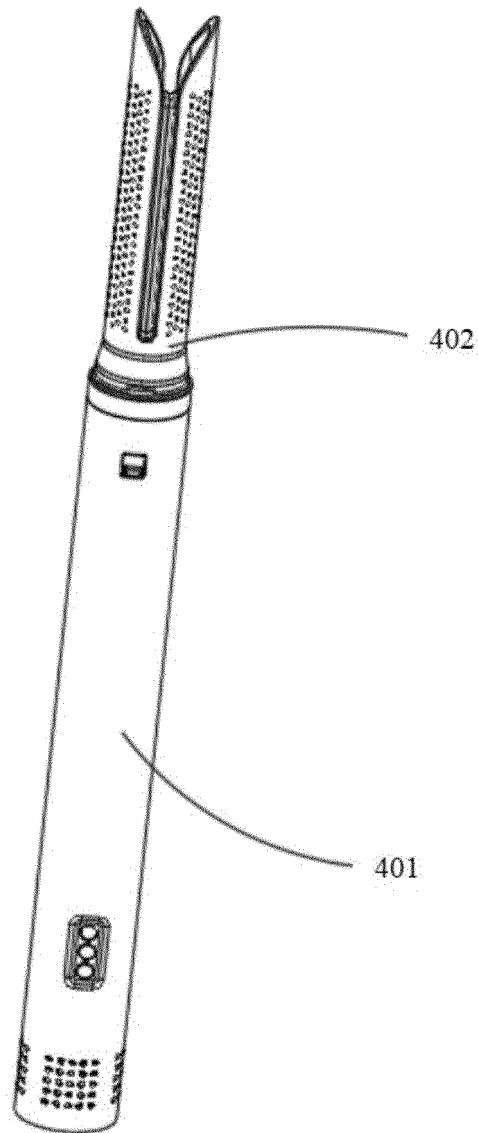


FIG. 29

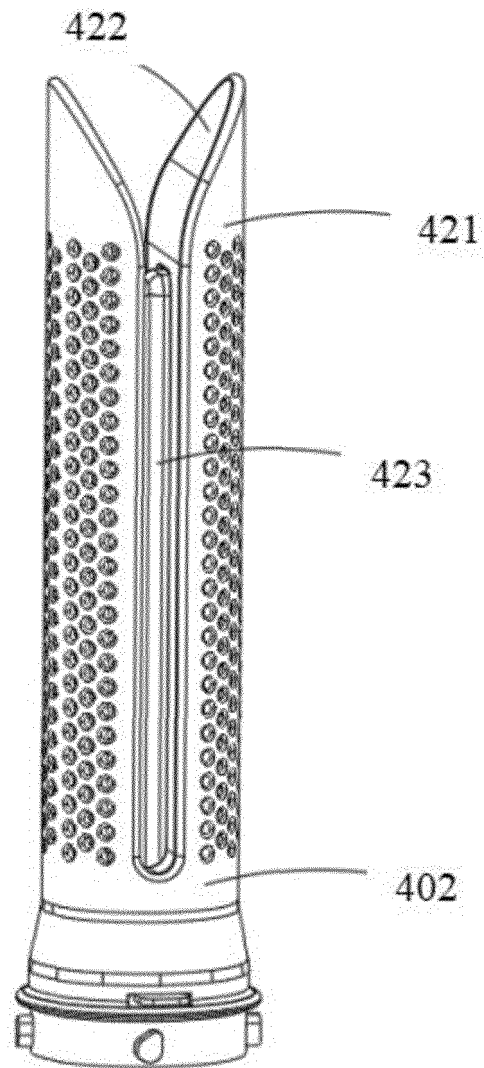


FIG. 30

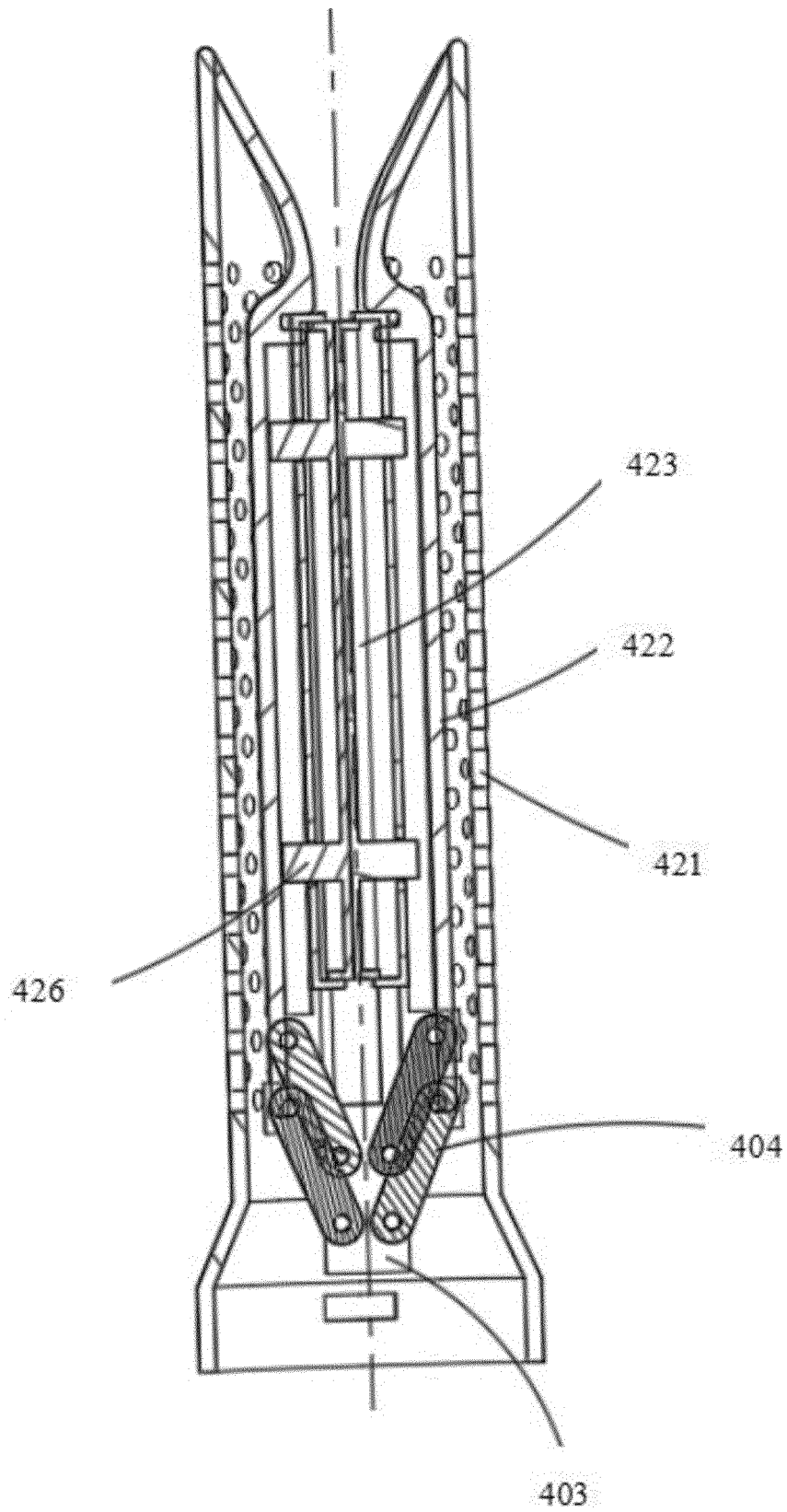


FIG. 32

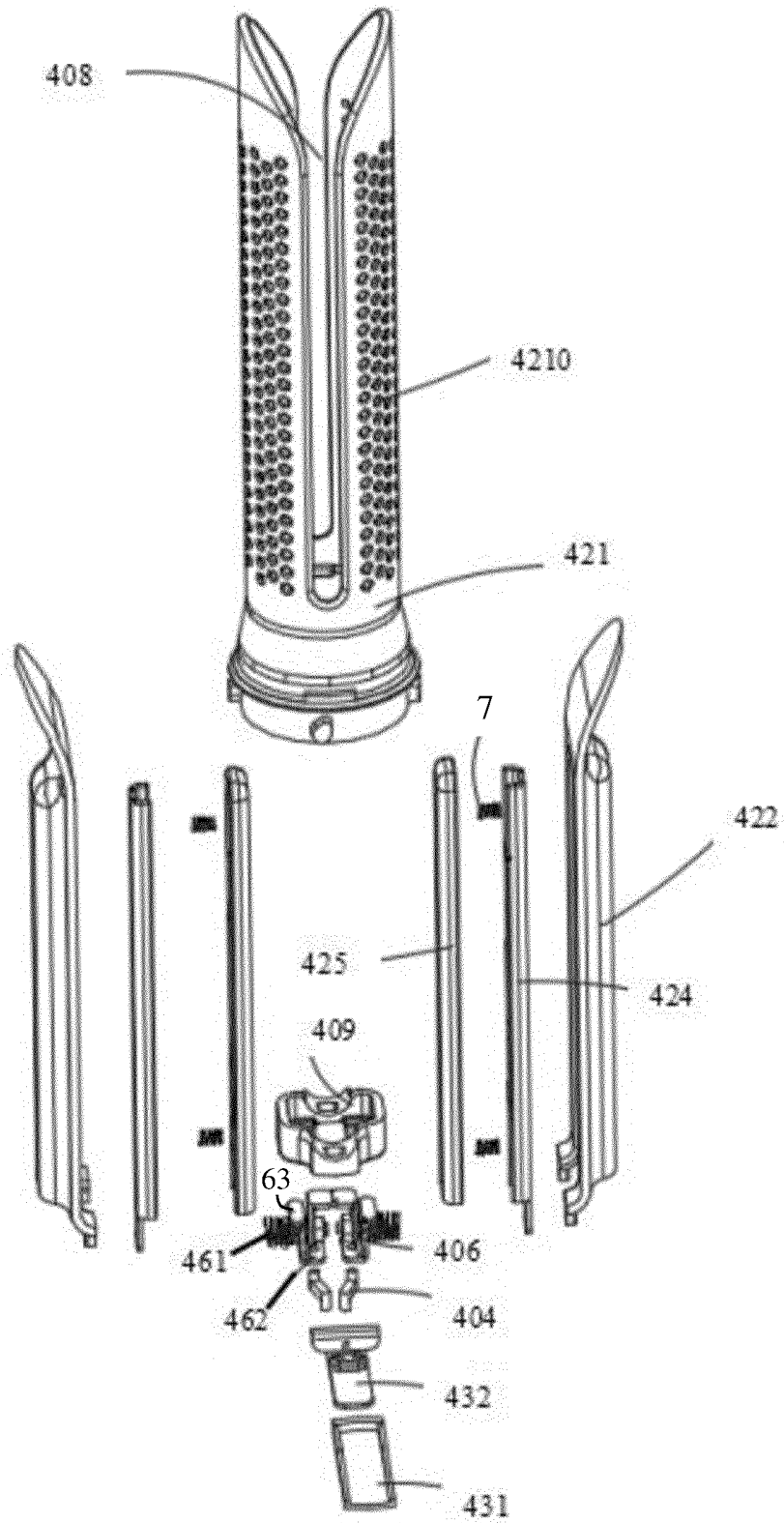


FIG. 33

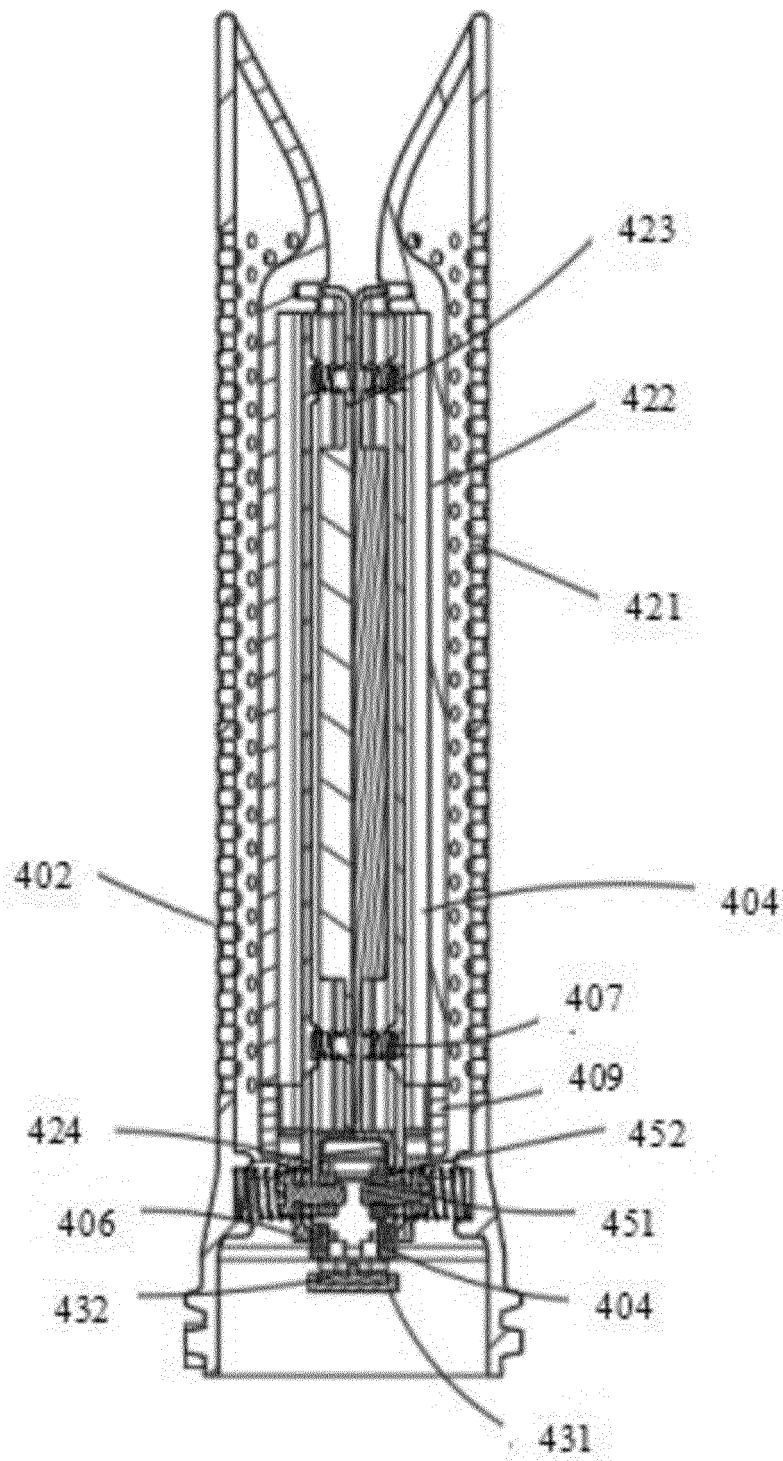


FIG. 34

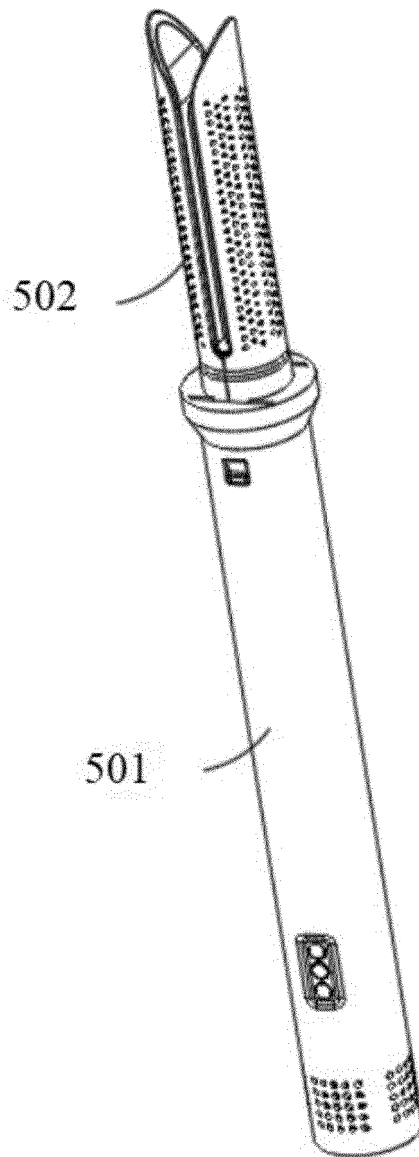


FIG. 35

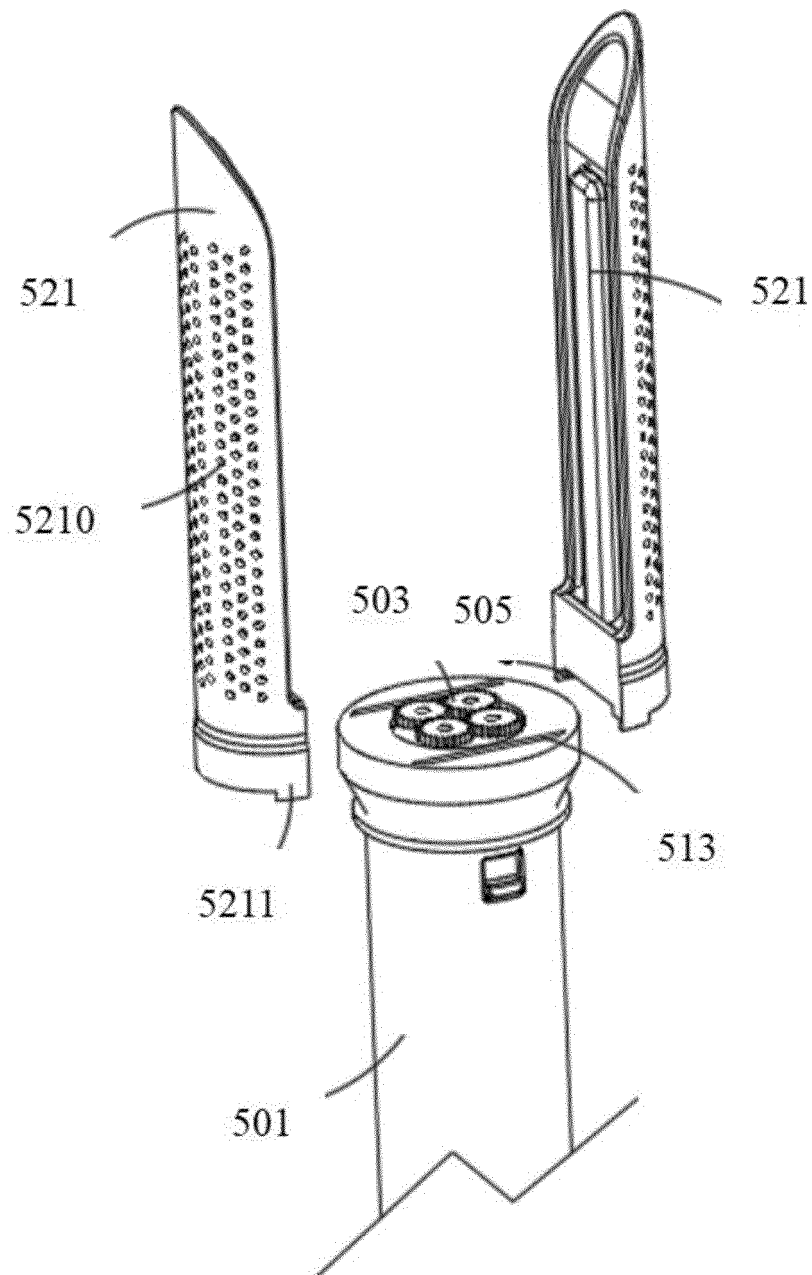


FIG. 36

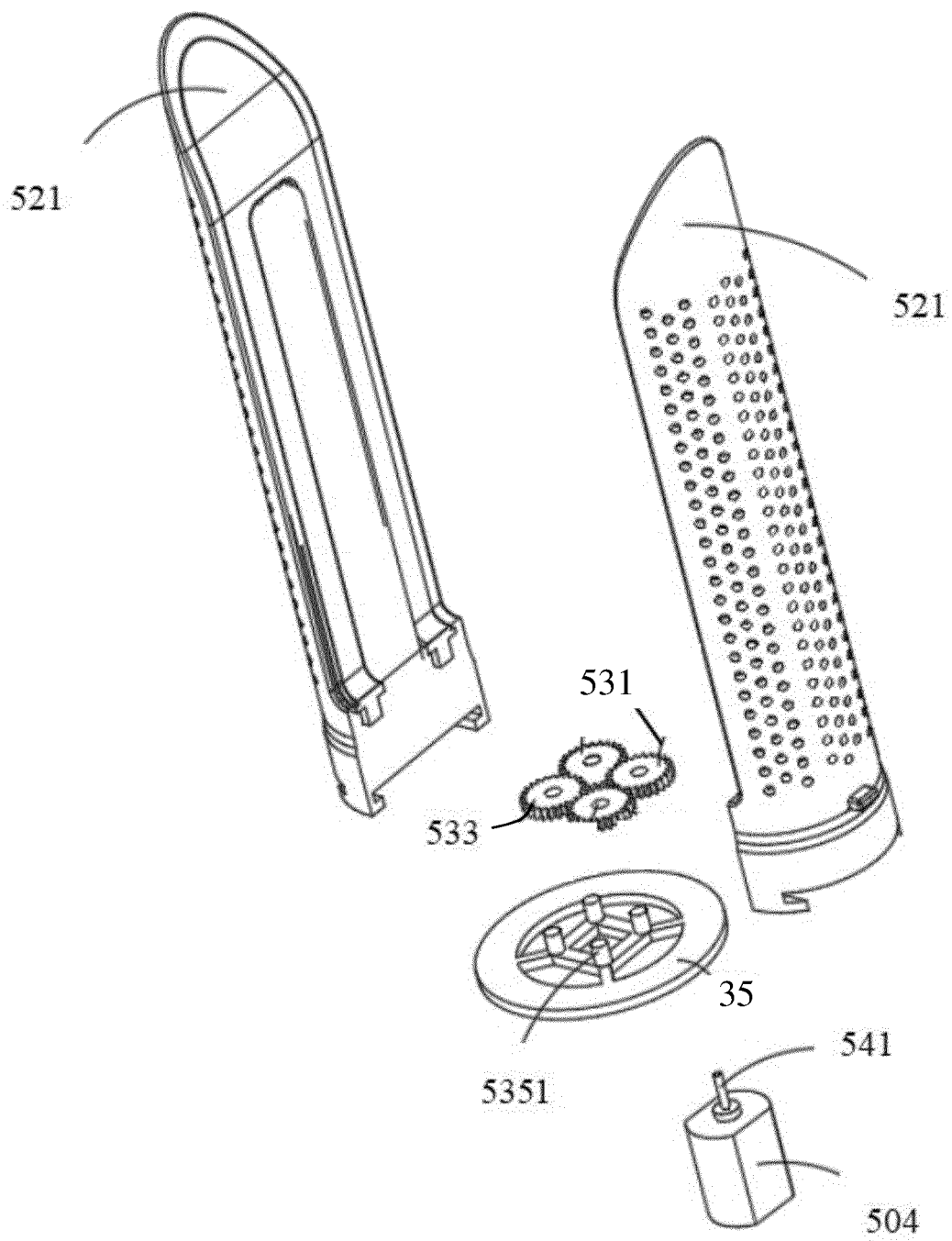


FIG. 37

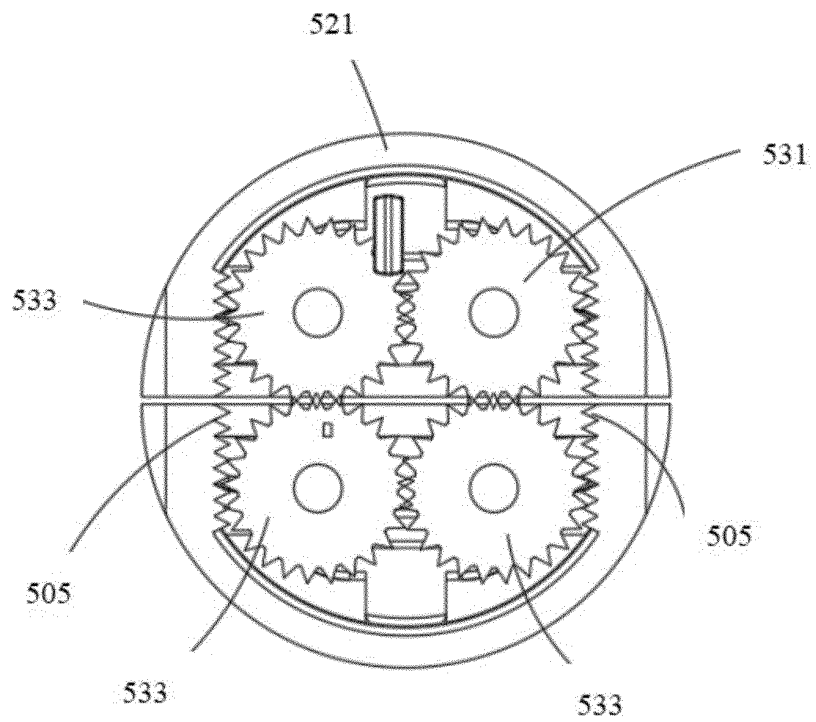


FIG. 38

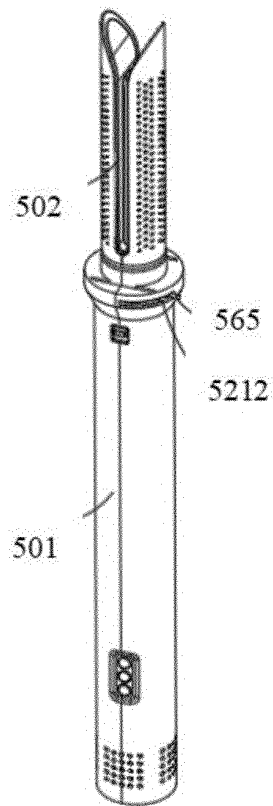


FIG. 39

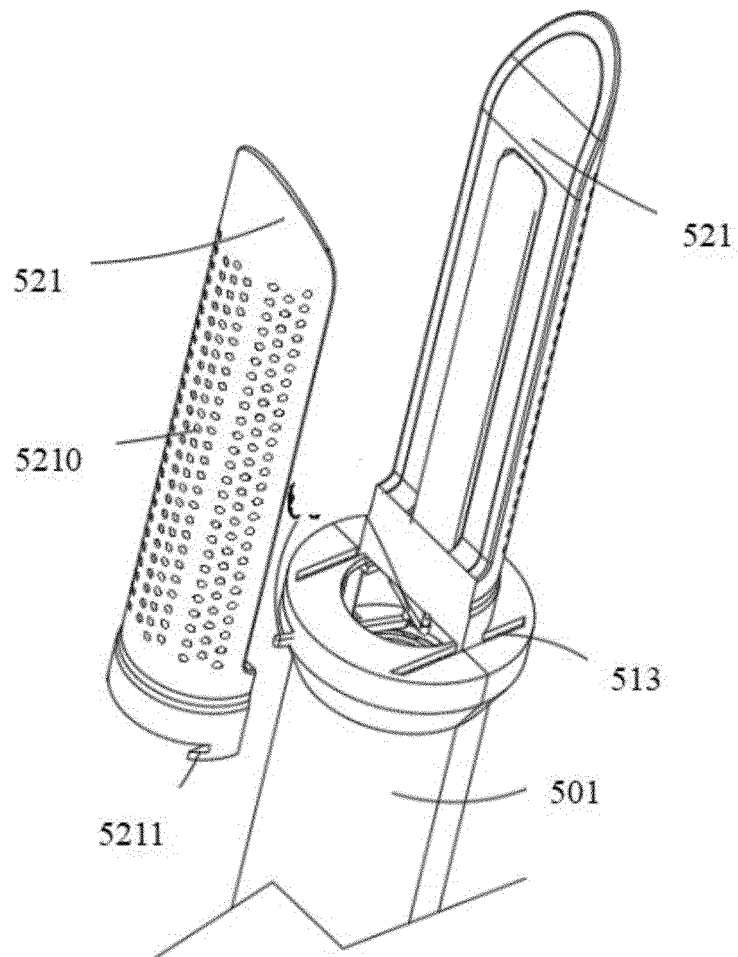


FIG. 40

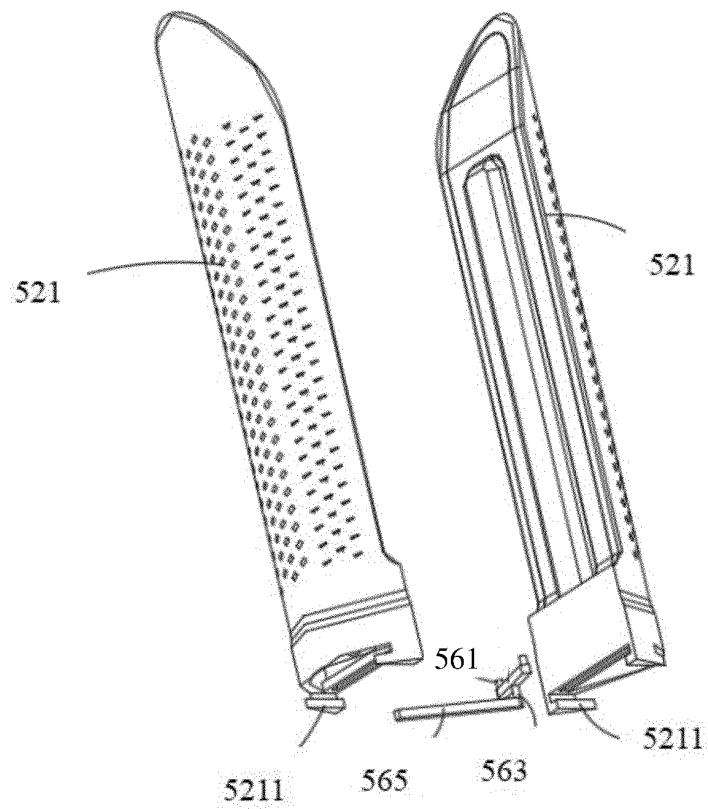


FIG. 41

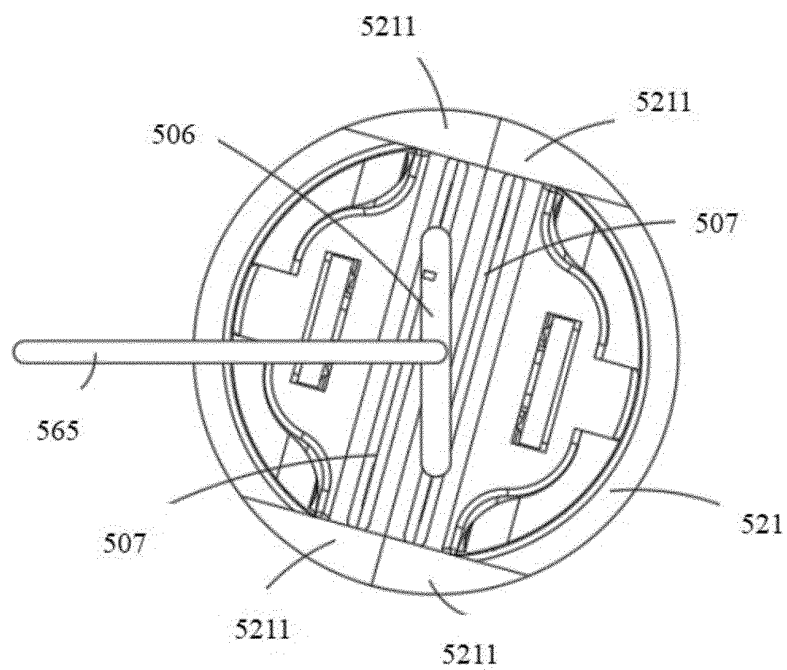


FIG. 42

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2021/110727

A. CLASSIFICATION OF SUBJECT MATTER A45D 2/10(2006.01)i; A45D 2/36(2006.01)i; A45D 6/00(2006.01)i; A45D 1/04(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																								
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) VEN, CNABS, CNKI, CNTXT, 卷发, 转动, 旋转, 风扇, 风机, 电机, 传动, 夹, 加热, 电热, 发热, 出风, 孔, 槽, 开口, 斜, 间隙, 伸缩, 伸展, 收缩, curl+, heat+, rotat+, gap, clamp+, motor, automatic, outlet, air+, hole?, opening, oblique+, inclin+, angle, mov+, fan, extend+, transmiss+, driv+																								
C. DOCUMENTS CONSIDERED TO BE RELEVANT																								
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>CN 107411301 A (Wu, Xinbo) 01 December 2017 (2017-12-01) description, paragraphs 10-50, and figures 1-6</td> <td>21-30</td> </tr> <tr> <td>Y</td> <td>CN 107411301 A (Wu, Xinbo) 01 December 2017 (2017-12-01) description, paragraphs 10-50, and figures 1-6</td> <td>1-20</td> </tr> <tr> <td>Y</td> <td>CN 110495694 A (OGAWA INTELLIGENT HEALTH TECHNOLOGY GROUP CO., LTD. et al.) 26 November 2019 (2019-11-26) description, paragraphs [0006]-[0049], and figures 1-8</td> <td>1-20</td> </tr> <tr> <td>X</td> <td>EP 3235397 A1 (SEB S.A.) 25 October 2017 (2017-10-25) description, columns 6-11, figures 1-9</td> <td>31-40</td> </tr> <tr> <td>X</td> <td>GB 2286772 B (CHINA PACIFIC TRADE LTD.) 19 November 1997 (1997-11-19) description, pages 2-6, and figures 1-8</td> <td>41-50</td> </tr> <tr> <td>X</td> <td>CN 107822293 A (SHENZHEN HUANTAI ELECTRICAL APPLIANCES CO., LTD.) 23 March 2018 (2018-03-23) description, paragraphs [0004]-[0059], and figures 1-8</td> <td>51-80</td> </tr> <tr> <td>Y</td> <td>CN 203801925 A (LIN, Yikun) 03 September 2014 (2014-09-03) description, paragraphs 4-29, and figures 1-4</td> <td>1-20</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	CN 107411301 A (Wu, Xinbo) 01 December 2017 (2017-12-01) description, paragraphs 10-50, and figures 1-6	21-30	Y	CN 107411301 A (Wu, Xinbo) 01 December 2017 (2017-12-01) description, paragraphs 10-50, and figures 1-6	1-20	Y	CN 110495694 A (OGAWA INTELLIGENT HEALTH TECHNOLOGY GROUP CO., LTD. et al.) 26 November 2019 (2019-11-26) description, paragraphs [0006]-[0049], and figures 1-8	1-20	X	EP 3235397 A1 (SEB S.A.) 25 October 2017 (2017-10-25) description, columns 6-11, figures 1-9	31-40	X	GB 2286772 B (CHINA PACIFIC TRADE LTD.) 19 November 1997 (1997-11-19) description, pages 2-6, and figures 1-8	41-50	X	CN 107822293 A (SHENZHEN HUANTAI ELECTRICAL APPLIANCES CO., LTD.) 23 March 2018 (2018-03-23) description, paragraphs [0004]-[0059], and figures 1-8	51-80	Y	CN 203801925 A (LIN, Yikun) 03 September 2014 (2014-09-03) description, paragraphs 4-29, and figures 1-4	1-20
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X	CN 107411301 A (Wu, Xinbo) 01 December 2017 (2017-12-01) description, paragraphs 10-50, and figures 1-6	21-30																						
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Y	CN 203801925 A (LIN, Yikun) 03 September 2014 (2014-09-03) description, paragraphs 4-29, and figures 1-4	1-20																						
☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.																								
<table border="0"> <tr> <td style="vertical-align: top;"> * 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 </td> <td style="vertical-align: top;"> “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 </td> </tr> </table>	* 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																						
* 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 03 November 2021	Date of mailing of the international search report 25 November 2021																							
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088 China Facsimile No. (86-10)62019451	Authorized officer Telephone No.																							

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

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2021/110727

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 203182248 U (DONGGUAN ROMAN ELECTRICAL TECHNOLOGY CO., LTD.) 11 September 2013 (2013-09-11) description, paragraphs 9-29, and figures 1-4	1-20
X	CN 111166034 A (SHENZHEN JINRI ELECTRICAL APPLIANCE CO., LTD.) 19 May 2020 (2020-05-19) description, paragraphs [0006]-[0045], and figures 1-11	51-80
X	CN 206744838 U (ZHEJIANG JINDELI ELECTRICAL APPLIANCES CO., LTD.) 15 December 2017 (2017-12-15) description, paragraphs [0006]-[0022], and figures 1-5	41-50
X	CN 207152183 U (ZHANGJIAJIE AVIATION INDUSTRY VOCATIONAL TECHNICAL COLLEGE) 30 March 2018 (2018-03-30) description, paragraphs 7-24, and figures 1-5	21-30
A	CN 210539509 U (OGAWA INTELLIGENT HEALTH TECHNOLOGY GROUP CO., LTD. et al.) 19 May 2020 (2020-05-19) entire document	1-80
A	CN 101803819 A (ZHOU, Beihua) 18 August 2010 (2010-08-18) entire document	1-80
PX	CN 111820569 A (DREAME TECHNOLOGY (SHANGHAI) CO., LTD.) 27 October 2020 (2020-10-27) description, paragraphs [0005]-[0079], and figures 1-12	1-30
PX	CN 213639954 U (DREAME TECHNOLOGY (SHANGHAI) CO., LTD.) 09 July 2021 (2021-07-09) description, paragraphs [0005]-[0081], and figures 1-12	1-30
PX	CN 111802776 A (DREAME TECHNOLOGY (SHANGHAI) CO., LTD.) 23 October 2020 (2020-10-23) description, paragraphs [0005]-[0069], and figures 1-8	41-50
PX	CN 112220184 A (DREAME TECHNOLOGY (SHANGHAI) CO., LTD.) 15 January 2021 (2021-01-15) description, paragraphs [0007]-[0062], and figures 1-8	51-60
PX	CN 213639956 U (DREAME TECHNOLOGY (SHANGHAI) CO., LTD.) 09 July 2021 (2021-07-09) description, paragraphs [0005]-[0082], and figures 1-12	1-30
PX	CN 213639957 U (DREAME TECHNOLOGY (SHANGHAI) CO., LTD.) 09 July 2021 (2021-07-09) description, paragraphs [0005]-[0080], and figures 1-12	1-30

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Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

- [1] Independent claim 1 has unity with independent claims 11, 31 and 37, but the same technical features which independent claim 1 shares with independent claims 21, 26, 29, 41, 51, 61 and 71 (a handle, and a fan) are customary technical means in the present field. Therefore, independent claim 1 and independent claims 21, 26, 29, 41, 51, 61 and 71 belong to different inventive concepts, lack unity, and do not satisfy the criteria of PCT Rule 13.1, 13.2 and 13.3.

1. ☒ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2021/110727

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 107411301 A	01 December 2017	None	
CN 110495694 A	26 November 2019	None	
EP 3235397 A1	25 October 2017	FR 3049830 A1	13 October 2017
		FR 3049830 B1	02 August 2019
		TR 201904002 T4	22 April 2019
		ES 2716953 T3	18 June 2019
		EP 3235397 B1	20 February 2019
		CN 107259761 A	20 October 2017
		CN 207506111 U	19 June 2018
GB 2286772 B	19 November 1997	GB 9402558 D0	06 April 1994
		GB 2286772 A	30 August 1995
CN 107822293 A	23 March 2018	CN 207428673 U	01 June 2018
CN 203801925 A	01 December 2017	None	
CN 203182248 U	11 September 2013	None	
CN 111166034 A	19 May 2020	CN 212630176 U	02 March 2021
CN 206744838 U	15 December 2017	None	
CN 207152183 U	30 March 2018	None	
CN 210539509 U	19 May 2020	CN 110215035 A	10 September 2019
CN 101803819 A	18 August 2010	CN 101803819 B	10 October 2012
CN 111820569 A	27 October 2020	CN 212465222 U	05 February 2021
CN 213639954 U	09 July 2021	None	
CN 111802776 A	23 October 2020	CN 212650551 U	05 March 2021
CN 112220184 A	15 January 2021	None	
CN 213639956 U	09 July 2021	None	
CN 213639957 U	09 July 2021	None	

Form PCT/ISA/210 (patent family annex) (January 2015)