

DESCRIPTION

TITLE OF INVENTION: HAIR DRYER

TECHNICAL FIELD

The present invention relates to the field of hair dryers, and more particularly to a hair dryer.

BACKGROUND

A hair dryer comprises a main body and a handle. A motor and fan blades are disposed within the handle. A heater assembly, a PCB board and a mounting frame are disposed within the main body. Due to the thickness of electronic components on the PCB board, the axial length of the heater assembly and the installation location of the mounting frame, the interior space of the main body is critically limited. In most ordinary hair dryers, the axial lengths of the main bodies are increased to meet the requirement of the length of the heater assembly and that of the thickness of the PCB board. Consequently, the length of the main body is too large to provide the desired compactness and user experience.

SUMMARY

In view of the above-described problems, it is an object of the present invention to provide a hair dryer, in which a distance between axially opposite ends of a first outer housing is less than a predetermined distance. This allows a main body housing of the hair dryer to be designed with a desired small axial length and size, providing an excellent user experience.

To this end, the present invention provides a hair dryer comprising a main body housing. The main body housing comprises a first outer housing and an inner handle housing. The first outer housing comprises a first central axis and has two axially opposite ends, which are respectively an air outlet end and an air-blocking end. A distance between the air outlet end and the air-blocking end is less than a

predetermined distance.

The inner handle housing is connected to an axially central portion of the first outer housing and comprises a second central axis. The first central axis and the second central axis form a predetermined angle.

In some embodiments, the inner handle housing has a diameter not exceeding an axial length of the first outer housing, wherein the connecting position of the first outer housing and the inner handle housing is spaced from the air outlet end at a distance less than a radius of the inner handle housing. In addition, the connecting position of the first outer housing and the inner handle housing is spaced from air-blocking end at a distance less than the radius of the inner handle housing.

In some embodiments, an air outlet enclosure is disposed at the air outlet end, and a heater assembly, a PCB board and a first mounting frame are disposed within the air outlet enclosure. The first mounting frame is disposed between the heater assembly and the PCB board. The first mounting frame is fixedly connected to the heater assembly and the PCB board. The heater assembly is disposed proximal to the air outlet end, wherein an air-blocking enclosure is disposed at the air-blocking end and fixedly connected to the first mounting frame.

In some embodiments, the PCB board is disposed on a side proximal to the air-blocking end with respect to the second central axis.

There are gaps between the first mounting frame and each of the PCB board and the heater assembly, and an end of the heater assembly is located on the side proximal to the air-blocking end with respect to the second central axis.

In some embodiments, a control module is disposed on the inner handle housing at an end thereof proximal to the first outer housing, and said control module is recessed in a radial direction of the inner handle housing toward the air outlet end. The control module comprises a second flow-guiding surface and a third flow-guiding surface, and the second flow-guiding surface is located at an end of the control module proximal to the first outer housing, with the PCB board being flush with an end of the second flow-guiding surface proximal to the inner handle housing. The third flow-guiding surface is located at an end of the control module away from the

first outer housing.

In some embodiments, a flow-guiding member is disposed on the inner handle housing at the end thereof proximal to the first outer housing, wherein said flow-guiding member is relatively proximal to the air outlet end, and the flow-guiding member comprises a first flow-guiding surface having a direction of flow-guiding opposite to that of the second flow-guiding surface so that the cold airflow in the inner handle housing is able to flow over the first flow-guiding surface of the flow-guiding member toward the PCB board. The first mounting frame further comprises a number of first through-holes, which allow the airflow flowing through the PCB board to, by passing through the first through-holes along the first central axis, flow toward the air outlet end and flow through the heater assembly.

In some embodiments, the heater assembly comprises a heating wire assembly, an annular inner shell, an annular outer shell and a second mounting frame. A number of supporting elements, arranged circumferentially around the first central axis, are disposed in the annular inner shell, and the heating wire assembly, arranged circumferentially around the first central axis, are disposed on the respective supporting elements, with the end of the heating wire assembly proximal to the air-blocking end being relatively located on the second central axis. Both the annular outer shell and the annular inner shell are disposed on a side of the second mounting frame proximal to the air outlet end, and the annular outer shell is coaxially sleeved over the annular inner shell.

In some embodiments, the supporting elements are symmetrical about the second central axis, wherein one of the supporting elements proximal to the inner handle housing is deployed along the second central axis so that the airflow reaching this support element is split into two symmetrical streams flowing toward opposite sides of the heater assembly.

In some embodiments, the annular inner shell is sleeved over the second mounting frame on the side thereof proximal to the air outlet end, wherein the second mounting frame comprises securing recesses at locations corresponding to the supporting elements, and the supporting elements are engaged in the securing

recesses.

In some embodiments, first snap fasteners and first securing structures are disposed at one end of the first mounting frame, wherein the first snap fasteners are clipped onto peripheral edges of the PCB board, and the first securing structures extend through the PCB board and are fixedly connected to the air-blocking enclosure. Second snap fasteners and second securing structures are disposed at the other end of the first mounting frame, wherein the second snap fasteners are clipped onto the second mounting frame, and the second securing structures are fixedly connected to the second mounting frame.

In some embodiments, a thermistor and a temperature controller are disposed on the annular inner shell at an end thereof proximal to the air outlet end, said thermistor and said temperature controller being symmetrical with respect to the first central axis and relatively located centrally on left and right sides of an outer circumferential surface of the annular inner shell.

In some embodiments, a capacitor is disposed centrally on the PCB board at an end thereof proximal to the air outlet end, wherein said capacitor extends through the first mounting frame and the second mounting frame and into the interior of the annular inner shell, and said capacitor does not protrude out of the annular inner shell.

In some embodiments, the inner handle housing comprises a first inner housing and a second inner housing, wherein an annular connecting section is disposed on the first inner housing at an end thereof proximal to the first outer housing, and the annular connecting section is secured to a central portion of the first outer housing. The second outer housing is clipped onto the first outer housing along the first central axis, and said first outer housing is proximal to the air outlet end.

In some embodiments, a control module is disposed on the first outer housing in a side thereof proximal to the air-blocking end, wherein the annular connecting section comprises a first plug-in section in a side thereof proximal to the air outlet end, and a flow-guiding member is inserted into the first plug-in section. An air-blowing assembly is disposed within the first outer housing.

In some embodiments, the hair dryer further comprises a second outer housing

disposed over the inner handle housing along the second central axis. A hood and an inner filter mesh frame are disposed on the second outer housing at an end thereof away from the first outer housing, and wherein the inner filter mesh frame is clipped onto the first outer housing, and the hood is detachably disposed on the inner filter mesh frame by a magnetically attractive means.

Compared with the prior art, the hair dryer of the present invention offers the following beneficial effects:

1. The distance between the axially opposite ends of the first outer housing is less than the predetermined distance. This allows the main body housing of the hair dryer to be designed with a desired small axial length and size, providing an excellent user experience.

2. The distances from the connecting position of the inner handle housing and the first outer housing to the air-discharging and -blocking ends are both less than or equal to the radius of the inner handle housing, making the axial length of the main body housing less than or equal to twice the diameter of the inner handle housing. Since the axial length of the main body housing is less than or equal to twice the diameter of the inner handle housing, the first outer housing is allowed to be designed with a small axial length and size.

3. Through arranging the end of the heater assembly proximal to the air-blocking end on the side proximal to the air-blocking end with respect to the second central axis, the axial length of the heater assembly in the hair dryer of the invention is allowed to be as large as possible to enable the heater assembly to heat the airflow as rapidly and well as possible, thereby ensuring air heating performance of the hair dryer.

4. Since the PCB board is flush with the end of the second flow-guiding surface proximal to the inner handle housing, the cold airflow in the inner handle housing can be flow-guided by the second and third flow-guiding surfaces of the control module onto a surface of the PCB board, facilitating heat dissipation from the PCB board and avoiding the service life of the PCB board from being shortened due to overheat.

5. Due to the presence of the flow-guiding member at the end of the inner handle housing proximal to the first outer housing, and since the first flow-guiding surface of

the flow-guiding member has a direction of flow-guiding opposite to that of the second flow-guiding surface, an air passage there has a reduced cross-sectional area, which allows cold air to flow through the air passage at a higher speed. This increases fluidity of the cold air and mitigates its buildup. Thus, the cold air can flow to both front and rear sides of the PCB board, leading to its increased presence around the PCB board and further facilitating heat dissipation from the PCB board.

6. Through orienting a support element proximal to the inner handle housing with respect to the second central axis, the airflow reaching this support element will be split into two symmetrical streams flowing toward opposite sides of the heater assembly. As a result, the airflow on the sides of the heater assembly is made more uniform, allowing for consistent and robust air output and heating.

7. Once the annular inner shell is sleeved over the second mounting frame, with the supporting elements being inserted in the securing recesses, the annular inner shell and the supporting elements are securely affixed to the second mounting frame, facilitating fixed connecting of the heater assembly to the first mounting frame. Additionally, with this arrangement, the heater assembly is allowed to have an effectively reduced axial length.

8. The thermistor and the temperature controller are symmetrical about the first central axis, resulting in a more sensible spatial layout. Moreover, the thermistor and the temperature controller are spaced apart from each other, enabling temperature monitoring of the hot airflow through the heating wire assembly over a wider range. Further, the supporting elements divide the annular inner shell into equal regions, and the thermistor and the temperature controller are located centrally on the left and right sides of the outer circumferential surface of the annular inner shell, where the highest temperature in the annular outer shell is present. With this arrangement, the thermistor and the temperature controller can monitor the temperature of the hot airflow through the heating wire assembly in a timely and accurate manner.

BRIEF DESCRIPTION OF THE DRAWINGS

Preferred embodiments will be described below with reference to the

accompanying drawings in a clear and readily understandable manner, in order to further explain the above characteristics, features, advantages and implementations thereof. Fig. 1 shows an overview of a hair dryer.

Fig. 2 shows a side view of a main body housing.

Fig. 3 shows a cross-sectional view of the hair dryer.

Fig. 4 is a view showing the location of a PCB board.

Fig. 5 shows an exploded view of the hair dryer.

Fig. 6 shows the structure of an air outlet enclosure.

Fig. 7 shows the structure of a heater assembly.

Fig. 8 shows an assembly view of an annular inner shell.

Fig. 9 shows the structure of a first mounting frame.

Fig. 10 is a view showing the connection of the heater assembly and the PCB board.

Fig. 11 is a view showing the locations of a flow-guiding member and a control module.

Fig. 12 shows the structure of the control module.

Fig. 13 shows the structure of a flow-guiding member.

Fig. 14 is a view showing the locations of a hood and an inner filter mesh frame.

The reference numerals in the drawings refer to the following technical features:

1, main body housing; 11, first outer housing; 111, air outlet enclosure; 112, air-blocking enclosure; 12, inner handle housing; 121, first inner housing; 1211, first plug-in section; 122, second inner housing; 123, control module; 1231, second flow-guiding surface; 1232, third flow-guiding surface; 1233, fourth flow-guiding surface; 124, flow-guiding member; 1241, first flow-guiding surface; 1242, fifth flow-guiding surface; 1243, first insertion recess; 125, thermistor; 126, temperature controller; 2, heater assembly; 21, heating wire assembly; 22, annular inner shell; 221, support element; 23, annular outer shell; 24, second mounting frame; 241, securing recess; 242, second supporting section; 3, PCB board; 31, capacitor; 4, first mounting frame; 41, first through-hole; 42, first snap fastener; 43, first securing structure; 44, second snap fastener; 45, second securing structure; 46, first supporting section; 5,

air-blowing assembly; 6, second outer housing; 61, hood; 62, inner filter mesh frame.

DETAILED DESCRIPTION OF EMBODIMENTS

In order to more clearly explain embodiments of the present invention, or techniques of the prior art, specific embodiments of the present invention will be described below with reference to the accompanying drawings. Apparently, these drawings show only some embodiments of the present invention, and in light of them, those of ordinary skill in the art can obtain other drawings and embodiments, without paying any creative effort.

For clarity and simplicity, the figures schematically illustrate only structural elements relevant to the present invention, which do not represent real-world structural components of the product. Moreover, for clarity and simplicity, and in order to facilitate understanding, out of several structurally or functionally identical components, only one may be schematically depicted or labeled in some of the figures. As used herein, the singular forms “a”, “an” and “the” include plural referents.

It should be further understood that, as used herein and in the appended claims, the term “and/or” includes any and all combinations of one or more of the associated listed items.

It should be noted that, as used herein, unless otherwise clearly specified or defined, the terms “mounted”, “coupled”, “connected” and any variants thereof should be interpreted in a broad sense. For instance, a connection may be a permanent, detachable or integral connection; or a mechanical or electrical connection; or a direct or indirect connection with one or more intervening media; or an internal communication between two elements. Those of ordinary skill in the art can understand the specific meanings of the above-mentioned terms herein, depending on their context.

Further, as used herein, the terms “first”, “second”, etc. may be used only as distinguishing labels and are not to be construed as indicating or implying relative importance. It should be noted that the foregoing embodiments can be arbitrarily combined, if required. Described above are merely a few preferred embodiments of

the present invention. It should be pointed out that many alternations and modifications would be possible to those of ordinary skill in the art, without departing from the principles of the invention. Accordingly, it is intended that all these alternations and modifications also fall within the scope of the invention.

Referring to Figs. 1 and 2, the present invention provides a hair dryer including a main body housing 1, which includes a first outer housing 11 and an inner handle housing 12. The first outer housing 11 comprises a first central axis and two axially opposite ends, which are respectively an air outlet end and an air-blocking end and spaced at a distance less than a predetermined distance. The inner handle housing 12 is connected to an axially central portion of the first outer housing 11 and comprises a second central axis extending at a predetermined angle with respect to the first central axis.

In the present embodiment, since the distance between the two axially opposite ends of the first outer housing 11 is less than the predetermined distance, the main body housing of the hair dryer is allowed to be designed with a desirably small axial length and size, which provides an excellent user experience.

Specifically, there is a connecting end face between the inner handle housing 12 and the first outer housing 11, and, along the first central axis, the connecting end face comprises a first end and a second end opposite to the first end. The first end is proximal to the air outlet end, and the second end is proximal to the air-blocking end. The distance between the air outlet end and the air-blocking end is smaller than a predetermined distance, and the predetermined distance is less than or equal to twice the distance between the first end and the second end. Denoting the distance between the first end and the second end as $L1$, a distance between the first end and the air outlet end as $L2$, and a distance between the second end and the air-blocking end as $L3$, $L1 + L2 + L3 \leq 2 * L1$ is satisfied, i.e., $L2 + L3 \leq L1$. The sum of the distance between the first end and the air outlet end and the distance between the second end and the air-blocking end may be less than the distance between the first end and the second end. Preferably, the distance between the first end and the air outlet end is less than or equal to half of the distance between the first end and the second end, i.e., $L2$

$\leq L1*1/2$, and the distance between the second end and the air-blocking end is less than or equal to half of the distance between the first end and the second end, i.e., $L3 \leq L1*1/2$. With this arrangement, the main body housing of the hair dryer is allowed to be designed with a desired small axial length and size, which provides an excellent user experience.

Notably, in the present embodiment, the predetermined angle of the first and second central axes is not particularly limited, and any value that allows the distance between the air outlet end and -blocking end to be less than the predetermined distance is considered within the scope of the application.

Additionally, both the inner handle housing and the first outer housing may be annular, with the first central axis and the second central axis forming an angle of 90° . That is, the first outer housing 11 and the inner handle housing 12 may be perpendicular to each other. Moreover, the inner handle housing 12 and the first outer housing 11 may be in communication with each other. In this case, the distance between the first end and the second end may be equal to a diameter of the inner handle housing 12, which does not exceed an axial length of the first outer housing 11. The connecting position of the first outer housing 11 and the inner handle housing 12 is spaced from the air-exit end at a distance, which does not exceed a radius of the inner handle housing 12. The connecting position of the first outer housing 11 and the inner handle housing 12 is spaced from the air-blocking end at a distance, which does not exceed the radius of the inner handle housing 12. As such, the axial length of the main body housing 1 does not exceed twice the diameter of the inner handle housing 12. With this arrangement, the main body housing 1 of the hair dryer is allowed to be designed with a desired small axial length and size, which provides an excellent user experience.

Specifically, a first length, which is defined as a length measured along the first central axis from an end of the inner handle housing 12 proximal to the air-blocking end of the main body housing 1 to this air-blocking end, is less than or equal to the radius of the inner handle housing 12. A second length, which is defined as a length measured along the first central axis from an end of the inner handle housing 12

proximal to the air outlet end of the main body housing 1 to this air outlet end, is also less than or equal to the radius of the inner handle housing 12. Accordingly, the sum of the first length and the second length is less than or equal to the diameter of the inner handle housing 12, and the axial length of the main body housing 1 is less than or equal to twice the diameter of the inner handle housing 12.

More specifically, referring to Fig. 5, an air outlet enclosure 111 is provided at the air outlet end, wherein a heater assembly 2, a PCB board 3 and a first mounting frame 4 are disposed therein. The first mounting frame 4 is provided between the heater assembly 2 and the PCB board 3 to fixedly connect them to each other. The heater assembly 2 is located proximal to the air outlet end. An air-blocking enclosure 112 is provided at the air-blocking end, which is fixedly connected to the first mounting frame 4. In the present embodiment, the first mounting frame 4 is fixedly connected to the heater assembly 2 and the PCB board 3 so that the heater assembly 2, the PCB board 3 and the first mounting frame 4 are integrated within the air outlet enclosure 111. The air outlet enclosure 111 is then inserted inside the main body housing 1 at the air outlet end. The air-blocking enclosure 112 is inserted inside the main body housing 1 at the air-blocking end and fixedly connected to the first mounting frame 4. Thus, the air-blocking enclosure 112 and the air outlet enclosure 111 are fixedly mounted at the axially opposite ends of the main body housing 1, and the heater assembly 2, the PCB board 3 and the first mounting frame 4 are fixedly mounted within the main body housing 1.

Notably, the air outlet enclosure 111 should comprise an air passage, which enables the air outlet enclosure 111 to communicate with the inner handle housing 12. The air passage extends toward the air-blocking end, and its bottom is flush with the end of the inner handle housing 12 proximal to the air outlet end. This allows cold air in the inner handle housing 12 to smoothly flow into the air outlet enclosure 111.

Further, the first length is slightly less than the second length. This enables that the distance from the connecting position of the first outer housing 11 and the inner handle housing 12 to the air outlet end is greater than the distance from the connecting position of the first outer housing 11 and the inner handle housing 12 to the

air-blocking end. This allows the air to take a longer time to flow through the heater assembly 2, ensuring good heating performance of the heater assembly 2.

Further, referring to Figs. 3 and 4, the PCB board 3 is disposed on a side proximal to the air-blocking end with respect to the second central axis. The first mounting frame 4 is spaced apart from both the PCB board 3 and the heater assembly 2 by gaps. An end of the heater assembly 2 proximal to the air-blocking end is located on the side proximal to the air-blocking end with respect to the second central axis.

In the present embodiment, the end of the heater assembly 2 proximal to the air-blocking end is located on the side proximal to the air-blocking end with respect to the second central axis. Consequently, the axial length of the heater assembly 2 in the hair dryer of the invention is allowed to be as large as possible, which enables the heater assembly 2 to heat the airflow flowing therethrough more rapidly and efficiently, thereby ensuring air heating performance of the hair dryer.

Specifically, the PCB board 3 and the first mounting frame 4 are both disposed on the side proximal to the air-blocking end with respect to the second central axis. Thus, the PCB board 3 and the first mounting frame 4 are both close to the air-blocking end of the main body housing 1. The second central axis equally divides the interior of the inner handle housing 12 into an upper portion and a lower portion. The upper portion is proximal to the air-blocking end, and the lower portion is proximal to the air outlet end. That is, the PCB board 3 and the first mounting frame 4 are located in the upper portion. Moreover, an end of the heater assembly 2 is located on the side proximal to the air-blocking end with respect to the second central axis. Thus, this end of the heater assembly 2 that is proximal to the air-blocking end is also located in the upper portion. The other end of the heater assembly 2 is located at the air outlet end. Therefore, the opposite ends of the heater assembly 2 are located on the opposite sides of the second central axis, and the length of the heater assembly 2 is greater than half the axial length of the first outer housing 11. With this arrangement, the interior of the first outer housing 11 can be utilized as efficiently as possible to enable the heater assembly 2 to heat the airflow flowing therethrough for an extended period of time, ensuring good heating performance of the hair dryer.

Notably, the PCB board 3 is circular, and its outer circumferential periphery has at least one flat edge. Due to the presence of this flat edge, there is a large gap between the PCB board 3 and an inner wall of the air outlet enclosure 111. The airflow flowing from the inner handle housing 12 toward the air outlet enclosure 111 can pass through the flat edge and reach a rear side of the PCB board 3. It then flows from the rear side of the PCB board 3 to a front side of the air outlet enclosure 111 and exits the air outlet end. In this way, better heat dissipation can be obtained from the PCB board 3.

Further, referring to Figs. 5 to 10, the heater assembly 2 includes a heating wire assembly 21, an annular inner shell 22, an annular outer shell 23 and a second mounting frame 24. The annular inner shell 22 is provided with a number of supporting elements 221 arranged circumferentially around the first central axis. The heating wire assembly 21 is disposed on the supporting elements 221 so as to extend circumferentially around the first central axis. An end of the heating wire assembly 21 proximal to the air-blocking end is located on the second central axis. Both the annular outer shell 23 and the annular inner shell 22 are disposed on a side of the second mounting frame 24 proximal to the air outlet end, with the annular outer shell 23 being disposed coaxially over the annular inner shell 22.

In the present embodiment, one end of the annular inner shell 22 is located on the side proximal to the air-blocking end with respect to the second central axis, and the end of the heating wire assembly 21 proximal to the air-blocking end is located on the second central axis. This not only ensures a desired axial length of the heating wire assembly 21 and hence good airflow-heating performance, but also allows the airflow to contact the heating wire assembly 21 for a shorter period of time, resulting in improved airflow-heating efficiency.

Specifically, the end of the heating wire assembly 21 proximal to the air-blocking end is located exactly at the center of an air passage in the inner handle housing 12. The heating wire assembly 21 includes at least one heating wire, which is wavy in shape and wound into a number of turns around an axis of the annular inner shell 22, and the plane in which each turn of the heating wire is situated is perpendicular to an

outer circumferential surface of the annular inner shell 22. A heating zone is formed between any two adjacent supporting elements 221. Portions of the heating wire is located in such heating zones. A starting end of the heating wire is located on the second central axis. Meanwhile, the heating wire is shaped in the form of waves. Within a wavelength range, the plane in which the heating wire is situated is substantially perpendicular to the axis of the annular inner shell 22. In other words, the plane in which each turn of the heating wire is situated is enabled to be perpendicular to the outer circumferential surface of the annular inner shell 22. This increases a contact area of the heating wire with the airflow flowing over it, which enables the heating wire to heat the air more efficiently. Preferably, the heating wire assembly 21 includes two heating wires, which are connected in parallel and wound side by side on the supporting elements 221 while being spaced at a predetermined interval. Compared with the use of a single heating wire, using two parallel-connected and spaced heating wires allows for a longer wire length and a larger contact area with the airflow, resulting in even higher airflow-heating efficiency. The coaxial arrangement of the annular outer shell 23 and the annular inner shell 22 allows the heating wire assembly 21 to be disposed between the annular outer shell 23 and the annular inner shell 22. In this way, heat from the heating wire assembly 21 can be better isolated, keeping the first outer housing 11 at a lower temperature, avoiding a user from getting scalded by the first outer housing 11 of the hair dryer, or avoiding the first outer housing 11 itself from deforming at an excessively high temperature. All these can improve user experience. Preferably, the annular outer shell 23 resides on an inner circumferential surface of the air outlet enclosure 111 and is conformal in shape to the air outlet enclosure 111. The annular inner shell 22 is positioned in the air-blocking enclosure 112 so as to be exactly coaxial with the annular outer shell 23. The annular outer shell 23, the annular inner shell 22 and the supporting elements 221 may be made of mica sheets, porous ceramics, ceramic-based thermal insulation materials or high-temperature resistant thermal insulation cotton, or made by spraying high-temperature resistant thermal insulation coatings on substrates. The heater assembly 2 and the PCB board 3 are fixedly connected with each other by the first

mounting frame 4. Consequently, the heater assembly 2 and the PCB board 3 can be mounted within the air outlet enclosure 111 in an integrated manner. This not only enhances the connection effects between the heater assembly 2 and the PCB board 3, but also shortens the axial length after they are mounted. Meanwhile, arranging the annular outer shell 23 on the inner circumferential surface of the air outlet enclosure 111 further improves the thermal insulation performance of the heater assembly 2, avoiding a user from getting scalded by the first outer housing 11, or avoiding the first outer housing 11 itself from deforming at an excessively high temperature. This compact layout allows for high space utilization.

Notably, each heating wire has a number of bent sections, which are joined end to end so that the heating wire has a contour in the shape of a closed circular wavy zigzag ring. It will be understood that such a circular wavy zigzag ring increases coverage of a first cavity by the heating wire, allowing the cold airflow flowing over the heating wire to be more rapidly heated to a higher temperature. Thus, improved heating efficiency can be obtained with a simple structural modification, as well as increased space utilization, resulting in an excellent utility. Each supporting element 221 comprises a number of stop teeth on its end face away from the annular inner shell 22, with stop notches being formed between adjacent stop teeth. A number of heating wires may be disposed in the corresponding stop notches so that the heating wires are prevented from being shifted. The heating wires are secured in the stop notches formed between the stop teeth. Consequently, the heating wires remain engaged in the stop notches during continuous output of hot or cold air, and they are not shifted under the action of the airflow, making the overall structure more reliable and of higher utility. Factors of the stop teeth, such as the number and width of them, may vary depending on the particular circumstances. For example, more or fewer teeth may be provided, or the width of the stop teeth may be changed to modify a width of the stop notches, depending on how the heating wires are wound.

Further, referring to Figs. 11 and 12, the inner handle housing 12 is provided with a control module 123 at its end proximal to the first outer housing 11. The control module 123 is recessed in a radial direction of the inner handle housing 12 toward the

air outlet end. The control module 123 comprises a second flow-guiding surface 1231 and a third flow-guiding surface 1232. The second flow-guiding surface 1231 is disposed at an end of the control module 123 proximal to the first outer housing 11, with the PCB board 3 being flush with an end of the second flow-guiding surface 1231 proximal to the inner handle housing 12. The third flow-guiding surface 1232 is disposed at an end of the control module 123 away from the first outer housing 11.

In the present embodiment, since the PCB board 3 is flush with the end of the second flow-guiding surface 1231 proximal to the inner handle housing 12, the cold airflow flowing from the inner handle housing 12 can be flow-guided by the second flow-guiding surface 1231 and the third flow-guiding surface 1232 of the control module 123 onto a surface of the PCB board 3, facilitating heat dissipation from the PCB board 3 and avoiding the service life of the PCB board 3 from being shortened due to overheat.

Specifically, a control component for controlling operation of the hair dryer is disposed within the control module 123. The control module 123 is located at the end of the inner handle housing 12 proximal to the air-blocking end and is an inwardly recessed portion of the inner handle housing 12. Specifically, the control module 123 comprises, in addition to the second flow-guiding surface 1231 and the third flow-guiding surface 1232, a fourth flow-guiding surface 1233 extending between the second flow-guiding surface 1231 and the third flow-guiding surface 1232 with respect to the second central axis. The second flow-guiding surface 1231 is proximal to the first outer housing 11 and extends outwards, while the third flow-guiding surface 1232 is distal from the first outer housing 11 and extends outwards. The second flow-guiding surface 1231 is inclined at an angle greater than an angle of inclination of the third flow-guiding surface 1232. This allows air to smoothly flow over the control module 123 at a large flow rate while generating low noise. In addition, since the PCB board 3 is flush with the end of the second flow-guiding surface 1231 proximal to the inner handle housing 12, cold air that reaches the first outer housing 11 flows along the second central axis over a lower surface of the PCB board 3, which is located in the PCB board 3's side proximal to the air outlet end.

Consequently, the cold airflow is not heated by the heater assembly 2, which helps to decrease the temperature of the PCB board 3. The cold airflow is prevented from being heated by the heater assembly 2 and then flowed over the PCB board 3, and thus the PCB board 3 is not overheated nor damaged. Additionally, the second flow-guiding surface 1231 is inclined towards the air-blocking end, imparting to the cold airflow in the inner handle housing 12 a tendency of flowing toward the air-blocking end. As a result, apart from flowing over the lower surface of the PCB board 3, a part of the cold airflow will reach the side of the PCB board 3 proximal to the air-blocking end and flow over an upper surface of the PCB board 3. In this way, heat from the surfaces of the PCB board 3 on its two opposite sides can be better carried away, preventing the components on the PCB board 3 from being overheated.

Further, referring to Figs. 12 and 13, a flow-guiding member 124 is provided at the end of the inner handle housing 12 proximal to the first outer housing 11. The flow-guiding member 124 is proximal to the air outlet end and comprises a first flow-guiding surface 1241 with a direction of flow-guiding opposite to that of the second flow-guiding surface 1231. Accordingly, a cold airflow in the inner handle housing 12 can flow over the first flow-guiding surface 1241 of the flow-guiding member 124 to the PCB board 3. The first mounting frame 4 also has a number of first through-holes 41, which allows the airflow flowing through the PCB board 3, by passing through the first through-hole 41 along the first central axis, to flow toward the air outlet end and to flow through the heater assembly 2.

In the present embodiment, due to the presence of the flow-guiding member 124 at the end of the inner handle housing 12 proximal to the first outer housing 11, and since the first flow-guiding surface 1241 of the flow-guiding member 124 has a direction of flow-guiding opposite to that of the second flow-guiding surface 1231, the air passage has a reduced cross-sectional area, which allows the cold airflow to flow through the air passage at a higher speed. This increases fluidity of the cold airflow and mitigates its buildup. Thus, the cold airflow can flow to both front and rear sides of the PCB board 3, and it could be concentrated around the PCB board 3, which further enhances the heat dissipation effects from the PCB board 3.

Specifically, the control module 123 and the flow-guiding member 124 are disposed on opposite sides of the second central axis. The first flow-guiding surface 1241 of the flow-guiding member 124 is inclined toward the air-blocking end and is increasingly raised in the direction of the airflow. That is, the flow-guiding member 124 has a thickness gradually increasing along the first central axis so that it approaches the control module 123 as it extends in this direction. Accordingly, the cross-sectional area of the air passage increasingly decreases. The first flow-guiding surface 1241 is close to the first outer housing 11 and blocks part of the air passage so that only a small portion of the heating wire assembly 21 is situated in the flow path of cold air, while its remaining majority portion is occluded by the flow-guiding member 124. As a result, the cold airflow preferentially flows over the first flow-guiding surface 1241 of the flow-guiding member 124 toward the air-blocking end through the PCB board 3. After that, it flows through the heater assembly 2 along the first central axis. Since the cross-sectional area of the air passage is reduced due to the presence of the flow-guiding member 124, the cold airflow can be increased in pressure, without increasing operating power of an air-blowing assembly 5. Therefore, the cold air can flow through the air passage at an increased speed with higher fluidity, allowing for air heating and output at a more consistent flow rate. In the present embodiment, three turns of the heating wire in the heating wire assembly 21 is located on the side of the first flow-guiding surface 1241 proximal to the air-blocking end, while its remainder is occluded by the flow-guiding member 124. The first through-holes 41 in the first mounting frame 4 form hollows therein. The first through-holes 41 are used to realize the flowing of the airflow between the heater assembly 2 and the PCB board 3. In this way, heat generated by components on the PCB board 3 can be carried away by the air flow through the first through-holes 41, avoiding overheating of the components, which may affect their normal operation. In addition, the first through-holes 41 increase the flow rate, volume and fluidity of the airflow between the heater assembly 2 and the PCB board 3.

Notably, the first flow-guiding surface 1241 may be inclined at an angle between 0 and 45° to ensure a smooth airflow with low noise. The flow-guiding member 124

also comprises a fifth flow-guiding surface 1242 at its end away from the first outer housing 11, which has a greater degree of inclination than the first flow-guiding surface 1241. Therefore, the fifth flow-guiding surface 1242 can divert the airflow flowing over it by a larger angle, compared with the first flow-guiding surface 1241, thereby better directing the air toward the PCB board 3 in the main body housing 1, with less noise generated, and hence improving user experience. The fifth flow-guiding surface 1242 has a smaller length than the first flow-guiding surface 1241, improving the stability of the flow-guiding effects. The fifth flow-guiding surface 1242 may be inclined at an angle in the range of 0 to 60°, resulting in good flow-guiding effects. The flow-guiding member 124 is not limited as described above, it may be alternatively implemented in the shape of a block, bar, tube, etc., as long as the desired functions can be provided.

Further, the inner handle housing 12 comprises a first plug-in section 1211, and the flow-guiding member 124 comprises a first insertion recess 1243. Assembly can be achieved simply by moving the flow-guiding member 124 upwards so that the first plug-in section 1211 is inserted into the first insertion recess 1243. With this arrangement, easy assembly and disassembly can be achieved with a simple structure. Meanwhile, to firmly secure the flow-guiding member 124 to the inner handle housing 12, the flow-guiding member 124 may be fastened to the inner handle housing 12 with a screw. Notably, the present application is not limited to any structure allowing engagement of the flow-guiding member 124 with the inner handle housing 12, and any such structure is considered within the scope of this application as long as it enables the flow-guiding member 124 to provide the desired flow-guiding functions.

Further, referring to Fig. 4, the supporting elements 221 are symmetrical about the second central axis, and one of the supporting elements 221 proximal to the inner handle housing 12 is deployed along the second central axis so that the airflow reaching this supporting element 221 is split into two symmetrical streams flowing toward opposite sides of the heater assembly.

In the present embodiment, through orienting the supporting element 221 proximal to the inner handle housing 12 along the second central axis, the airflow

reaching this supporting element 221 will be split into two symmetrical streams flowing toward opposite sides of the heater assembly 2. As a result, the airflows on both sides of the heater assembly 2 is made more uniform, allowing for consistent and robust air output and heating.

Specifically, a number of the supporting elements 221 are symmetrically and radially deployed along the annular inner shell 22. In addition, the encircled region formed between the annular outer shell 23 and the annular inner shell 22 are equally divided into a number of heating zones by the supporting elements 221, which facilitates air communication therebetween and increases the heating efficiency. The amount of the supporting elements 221 may vary depending on the size of the annular inner shell 22 or a desired heating effect. In the present embodiment, one of the supporting elements 221 proximal to the inner handle housing 12 is disposed along the second central axis so that the cold airflow from the inner handle housing 12, when reaching this supporting element 221, is split thereby into two equal airflows, which flow over an inner circumferential surface of the annular outer shell 23. Thus, the airflows on opposite sides of the supporting element 221 have substantially the same flow rate, resulting in more uniform airflows on opposite sides of the heater assembly 2 and hence in more uniform and a gentler hot airflow from the heater assembly 2. Thus, more consistent and more robust air output and heating can be achieved. Preferably, there are twelve supporting elements 221, which are equidistantly arranged around the annular inner shell 22 and divide the annular inner shell 22 into twelve equal heating regions. These heating regions are spaced at equal intervals, largely ensuring consistent air output. In alternative embodiments, the amount of the supporting elements 221 may be adjusted to increase or reduce the number of heating regions. Notably, the present application is not limited to any particular number of supporting elements 221, and the number may be, but is not limited to being, twelve. Any number of supporting elements 221 is considered within the scope of the present application, as long as one of them proximal to the inner handle housing 12 can be deployed along the second central axis to split the airflow into equal streams.

Further, referring to Figs. 7 and 8, the annular inner shell 22 is sleeved over the

second mounting frame 24 on its side proximal to the air outlet end. The second mounting frame 24 comprises securing recesses 241 at locations corresponding to the supporting elements 221. The supporting elements 221 can be engaged in the securing recesses 241.

In the present embodiment, since the annular inner shell 22 is sleeved over the second mounting frame 24, and the supporting elements 221 are inserted in the securing recesses 241, the annular inner shell 22 and the supporting elements 221 are securely and fixedly connected to the second mounting frame 24, facilitating the fixed connection between the heater assembly 2 and the first mounting frame 4. Additionally, with this arrangement, the axial length of the heater assembly 2 is effectively reduced.

Specifically, the securing recesses 241 are arranged circumferentially around an axis of the second mounting frame 24. The positions of the securing recesses 241 and those of the supporting elements 221 show one-to-one correspondence. The securing recesses 241 are open toward the air outlet end, and the annular inner shell 22 can be sleeved over an outer circumferential surface of the second mounting frame 24 along the first central axis so that the annular inner shell 22 and the second mounting frame 24 at least partially overlap, allowing the heater assembly 2 to have a reduced axial length. At this time, the supporting elements 221 are inserted into the securing recesses 241 in place. This provides support to the supporting elements 221 and increase the connection strength between the annular inner shell 22 and the second mounting frame 24, avoiding separation of the annular inner shell 22 from the second mounting frame 24. Preferably, a number of locating recesses are disposed on the annular inner shell 22, which correspond to the respective supporting elements 221. Each supporting element 221 comprises a locating snap-fit matching the respective locating recess. The locating snap-fits can be engaged in the respective locating recesses, thereby securing the supporting elements 221 to the annular inner shell 22. Engaging the locating snap-fits in the locating recesses ensures stability of the supporting elements 221 and hence accurate locating of the supporting elements 221. This facilitates the assembly of the supporting elements 221 and prevents the

supporting elements 221 from being shifted or slipped during assembly of the heating wire with the supporting elements 221 by an operator.

Further, referring to Figs. 9 and 10, one end of the first mounting frame 4 is provided with first snap fasteners 42 and first securing structures 43. The first snap fasteners 42 are clipped onto peripheral edges of the PCB board 3, and the first securing structures 43 extend through the PCB board 3 and fixedly connected to the air-blocking enclosure 112. The other end of the first mounting frame 4 is provided with second snap fasteners 44 and second securing structures 45. The second snap fasteners 44 are clipped on the second mounting frame 24, and the second securing structures 45 are fixedly connected to the second mounting frame 24.

In the present embodiment, the first mounting frame 4 is fixedly connected to the PCB board 3 by the first snap fasteners 42 and the first securing structures 43 and to the second mounting frame 24 by the second snap fasteners 44 and the second securing structures 45. Consequently, the PCB board 3 and heater assembly 2 are fixed within the air outlet enclosure 111, which increases the connection strength between the PCB board 3 and the heater assembly 2, and prevents the positions thereof to be changed. In addition, they could be assembled more efficiently.

Specifically, there are at least two first snap fasteners 42, which are provided on the side of the first mounting frame 4 proximal to the PCB board 3 at opposite outer edges thereof. The first snap fasteners 42 are adapted to be clipped onto, and thereby support and secure, the PCB board 3. Since the at least two first snap fasteners 42 are clipped onto the PCB board 3, the latter will be restricted from moving away from the first mounting frame 4. Thus, the outer edges of the PCB board 3 can be avoided from significant vibration under the action of the high-speed airflow, which may lead to cracking of the PCB board 3, or even cause damage thereto. Moreover, the connection between the PCB board 3 and the heater assembly 2 can be avoided from being destroyed. Further, affixing the PCB board 3 with the first snap fasteners 42 can improve the efficiency of assembly and disassembly. The first securing structures 43 include at least two first mounting posts, which are spaced apart on the side of the first mounting frame 4 proximal to the PCB board 3. In the PCB board 3, there are

mounting holes adapted for passage of the first mounting posts therethrough. After being passed through the mounting holes in the PCB board 3, the first mounting posts are fixedly connected to the air-blocking enclosure 112. Through arranging the spaced first mounting posts, not only relative rotation of the PCB board 3 and the first mounting frame 4 can be prevented, but also the connection of the PCB board 3 and the heater assembly 2 can be prevented from being destroyed. At the same time, guided by the multiple first mounting posts, the PCB board 3 can be assembled more efficiently without errors. In the middle of the second mounting frame 24 on the side proximal to the air-blocking end, there is a second supporting section 242 adapted to maintain a gap between the first mounting frame 4 and the second mounting frame 24, avoiding the heater assembly 2 from getting too close to the first mounting frame 4 and causing damage to the first mounting frame 4. The first mounting frame 4 comprises a first supporting section 46 at a corresponding location. At the end of each second mounting post connected to the first mounting frame 4, a number of third supporting sections for supporting the PCB board 3 are arranged circumferentially around the specific second mounting post. Both the first supporting section 46 and the third supporting sections are provided to keep a gap between the first mounting frame 4 and the PCB board 3. On one hand, this avoids the first mounting frame 4 from getting too close to the PCB board 3 and affecting heat dissipation from the PCB board 3, and on the other hand, this avoids the first mounting frame 4 from compressing components on the PCB board 3. The first supporting section 46 comprises a first insertion opening, and the second supporting section comprises a second insertion opening. The second mounting frame 24 is provided with snap hooks, and the first supporting section 46 of the first mounting frame 4 comprises snap recesses. The snap hooks can be snapped into the snap recesses, allowing the second snap fasteners 44 to be clipped onto both the second supporting section 242 and the first supporting section 46. The second securing structures 45 include a number of second mounting posts and countersunk holes. The second mounting posts are provided on the side of the second mounting frame 24 proximal to the first mounting frame 4, and the first mounting frame 4 comprises countersunk holes at locations

corresponding to the second mounting posts. The second mounting posts can be fixedly connected in the countersunk holes with screws, thereby fixedly connecting the second mounting frame 24 to the first mounting frame 4. The screws may be received within the countersunk holes so as not to protrude beyond the surface of the first mounting frame 4 and thus not to interfere with any component on the PCB board 3. The second mounting frame 24 is exactly received in the gap between the second mounting frame 24 and the first mounting frame 4, without increasing the axial length of the heater assembly 2.

Notably, several first through-holes are disposed in the first mounting frame 4, and reinforcing ribs are disposed within the first through-holes. The reinforcing ribs are generally deployed in a radiating pattern, which can increase the overall strength of the first mounting frame 4. The reinforcing ribs include outer ribs and inner ribs. Each inner rib is connected at one end to an outer edge of the first mounting frame 4 and extends at the other end away from the first mounting frame 4. These inner ribs are generally deployed in a radiating pattern. The outer ribs interconnect the ends of the inner ribs away from the first mounting frame 4. The outer ribs and the inner ribs are disposed, and the inner ribs are generally deployed in a radiating pattern, which can facilitate smooth flow of the hot airflow from components on the PCB board through the first through-holes 41 while ensuring overall strength of the first mounting frame 4. The first snap fasteners 42 and the second snap fasteners 44 may include, but are not limited to, snap hooks, snap recesses and other snap fasteners. The first securing structures 43 and the second securing structures 45 may include, but are not limited to, mounting posts, screws and other securing structures.

Further, referring to Fig. 7, a thermistor 125 and a temperature controller 126 are disposed on the annular inner shell 22 at the end thereof proximal to the air outlet end, wherein the thermistor 125 and the temperature controller 126 are symmetrical with respect to the first central axis. The thermistor 125 and the temperature controller 126 are located centrally on left and right sides of the outer circumferential surface of the annular inner shell 22.

In the present embodiment, the thermistor 125 and the temperature controller 126

are symmetrical along the first central axis, resulting in a more reasonable spatial layout. Meanwhile, the thermistor 125 and the temperature controller 126 are spaced apart from each other, enabling to monitor the temperature of the hot airflow flowing through the heating wire assembly 21 over a wider range. Further, the annular inner shell 22 are equally divided by a number of supporting elements 221. The thermistor 125 and the temperature controller 126 are located centrally on the left and right sides of the outer circumferential surface of the annular inner shell 22, where the highest temperature in the annular outer shell 23 is present. With this arrangement, the thermistor 125 and the temperature controller 126 can monitor the temperature of the hot airflow flowing through the heating wire assembly 21 in a timely and accurate manner.

Specifically, the annular inner shell 22 comprises a second notch at the end proximal to the air outlet end, and the temperature controller 126 is mounted in the second notch so as to be located on the outer circumferential surface of the annular inner shell 22. The temperature controller 126 is spaced apart from the heating wire assembly 21 and situated close to the air outlet end of the main body housing 1. It can sample and monitor the hot airflow flowing through the heating wire assembly 21. The annular inner shell 22 also comprises a first notch at the end proximal to the air outlet end. A connector of the thermistor 125 extends through the first notch, and is connected to the PCB board 3 from the interior of the annular inner shell 22, which efficiently protects the connector. The first and second notches are located centrally on the left and right sides of the outer circumferential surface of the annular inner shell 22, and are symmetrical along the first central axis. Additionally, a fuse is provided over an inner circumferential surface of the annular inner shell 22, and it is deployed along the first central axis. The annular inner shell 22 comprises a third notch, which runs through the annular inner shell 22 and is disposed at the position corresponding to the fuse. The third notch matches the fuse, and the fuse is located internal to the annular inner shell 22. The fuse disposed over the inner circumferential surface of the annular inner shell 22 will blow when overloaded, which prevents the heating wire assembly 21 to be kept at high temperature, and prevents hair dryer to create serious

hazards. In addition, the presence of the third notch in the annular inner shell 22 that matches the fuse creates a desirable operating environment for the fuse, which prevents its premature and delayed activation.

Notably, in the present embodiment, twelve supporting elements 221 are equidistantly spaced on the annular inner shell 22 to divide it into twelve equal regions. Two of the supporting elements 221 on the left and right sides of the outer circumferential surface of the annular inner shell 22 are parallel to each other. The thermistor 125 is located above the supporting elements 221, and the temperature controller 126 is located below the supporting elements 221. Alternatively, the temperature controller 126 is located above the supporting elements 221, and the thermistor 125 is located below the supporting elements 221.

Further, referring to Fig. 10, a capacitor 31 is disposed at the center of the PCB board 3 at the end thereof proximal to the air outlet end. The capacitor 31 extends through the first mounting frame 4 and the second mounting frame 24 into the interior of the annular inner shell 22, without protruding out of the annular inner shell 22.

In the present embodiment, the capacitor 31 is disposed at the center of the PCB board 3 at the end thereof proximal to the air outlet end and extends through the first mounting frame 4 and the second mounting frame 24 into the interior of the annular inner shell 22. This effectively overcomes the problem of difficult accommodation of the capacitor 31 due to a large size and allows the main body housing 1 to have a reduced axial length. In addition, since the capacitor 31 is provided in the middle of the annular inner shell 22 without protruding out thereof, it can be effectively protected against damage from a high temperature.

Specifically, the capacitor 31 and the heater assembly 2 at least partially overlap, allowing a smaller gap to be left between the PCB board 3 and the heater assembly 2. This can reduce the space occupied by the PCB board 3 and the heater assembly 2 in the axial direction of the main body housing 1, allowing the main body housing 1 to be thinner to provide the desired compactness and satisfy user's requirements. The capacitor 31 is located within the interior of the annular inner shell 22, and the annular inner shell 22 can effectively decrease the heat transfer from the heating wire

assembly 21 toward the interior thereof. Consequently, the capacitor 31 can be avoided from being overheated. Moreover, this results in an overall simple structure and enables easy assembly. A second supporting section 242, having a second insertion opening, is disposed at the center of the second mounting frame 24 on the side thereof proximal to the air-blocking end, and the first supporting section 46, having a first insertion opening, is located on the first mounting frame 4 in the position corresponding to the first supporting section 242. The capacitor 31 extends through the first insertion opening in the first supporting section 46 and the second insertion opening in the second supporting section 242 and reaches into the interior of the annular inner shell 22, with the first supporting section 46 maintaining a gap between the first mounting frame 4 and the PCB board 3 and with the second supporting section 242 maintaining a gap between the first mounting frame 4 and the second mounting frame 24. With this arrangement, the PCB board 3 can be prevented from being too close to the heater assembly 2. Otherwise, the PCB board 3 may be overheated and damaged, or heat dissipation from components on the PCB board 3 may even fail, eventually leading to self-ignition of the PCB board 3. Further, the capacitor 31 extends through the first and second insertion openings, and the second supporting section 242 is contacted with the first supporting section 46, which is contacted with the PCB board 3. With the second supporting section 242 and the first supporting section 46 being installed outside the capacitor 31, the latter can be effectively protected against unnecessary heat exposure. During assembling, the second supporting section 242 and the first supporting section 46 provide some guidance, which facilitates the passage of the capacitor 31 through the first mounting frame 4 and the second mounting frame 24.

Further, referring to Figs. 2 and 14, the inner handle housing 12 includes a first inner housing 121 and a second inner housing 122. The first inner housing 121 has an annular connecting section at its end proximal to the first outer housing 11, which is secured to the central portion of the first outer housing 11. A second outer housing 6, along the first central axis, is clipped onto the first outer housing 11 that is proximal to the air outlet end.

In the present embodiment, the first inner housing 121 and the second inner housing 122 are clipped together vertically, forming the inner handle housing 12. This allows for easy and quick assembly. The annular connecting section of the first inner housing 121 can be fixedly connected to the first outer housing 11, drastically increasing the connection strength between the inner handle housing 12 and the first outer housing 11.

Specifically, the control module 123 is located on the side of the first outer housing 11 proximal to the air-blocking end, and the first plug-in section 1211 is disposed on a side of the annular connecting section proximal to the air outlet end. The flow-guiding member 124 is inserted into the first plug-in section 1211, and the air-blowing assembly 5 is provided inside the first outer housing 11.

Notably, the air-blowing assembly 5 may include, but is not limited to a fan, an air pump or the like. The present application is not limited in this regard.

Further, referring to Figs. 1 and 14, the hair dryer further comprises a second outer housing 6, which is sleeved over the inner handle housing 12 along the second central axis. A hood 61 and an inner filter mesh frame 62 are disposed at the end of the second outer housing 6 which is away from the first outer housing 11. The inner filter mesh frame 62 is clipped onto the first outer housing 11, and the hood 61 is detachably disposed on the inner filter mesh frame 62 by a magnetically attractive means.

In the present embodiment, through disposing the second outer housing 6 over the inner handle housing 12 along the second central axis, the control components and the air-blowing assembly 5 within the inner handle housing 12 can be effectively protected against damage. Besides, the hood 61 and the inner filter mesh frame 62 are provided at the end of the second outer housing 6 away from the first outer housing 11. An inner filter mesh may be attached to the inner filter mesh frame 62 to prevent ingress of foreign matter into the interior of the inner handle housing 12. The hood 61 is detachably disposed on the inner filter mesh frame 62 by the magnetically attractive means, which enables easy assembly and disassembly. The hood 61 can be easily removed to allow cleaning of the internal structures.

Specifically, air intake openings are disposed on the hood 61. An airflow can be taken from the outside into the inner handle housing 12 successively through the air intake openings and openings in the inner filter mesh. The inner filter mesh frame 62 comprises a first opening adapted for passage of a cable sleeve therethrough, and the hood 61 comprises a second opening also adapted for passage of the cable sleeve therethrough. The inner filter mesh frame 62 includes an upper end ring, a lower end plate and middle ribs connecting the upper end ring and the lower end plate. The upper end ring is detachably connected to a lower end of the second outer housing 6 by a connecting means. A first opening is disposed on the lower end plate, and the inner filter mesh is attached to the middle ribs and situated between the upper end ring and the lower end plate. The hood 61 includes a side wall and a top wall. The air intake openings are provided on the side wall, and the top wall is detachably connected to the lower end plate by the magnetically attractive means.

Notably, both the inner filter mesh and the inner filter mesh frame 62 are cylindrical. The second outer housing 6 comprises a sliding hole and a button hole for use by the control module 123. With this arrangement, control elements on the inner handle housing 12 can be manipulated from the side of the second outer housing 6.

It should be noted that the foregoing embodiments can be arbitrarily combined, if required. Described above are merely a few preferred embodiments of the present invention. It should be pointed out that many alternations and modifications would be possible to those of ordinary skill in the art, without departing from the principles of the invention. Accordingly, it is intended that all these alternations and modifications also fall within the scope of the invention.

What is claimed is:

1. A hair dryer comprising:

a main body housing comprising a first outer housing and an inner handle housing, wherein a connecting end face is disposed on the outer side wall of the first outer housing, and the inner handle housing is communicated with the first outer housing through the connecting end face,

wherein the first outer housing comprises a first central axis and two opposite ends along the first central axis, which are respectively an air outlet end and an air-blocking end, and,

wherein the connecting end face comprises two opposite ends along the first central axis, which are respectively a first end and a second end, and wherein a distance between the air outlet end and the air-blocking end is less than or equal to twice a distance between the first end and the second end.

2. The hair dryer according to claim 1, wherein the connecting end face is located centrally on the first outer housing along the first central axis, and the inner handle housing comprises a second central axis perpendicular to the first central axis, wherein the first end is proximal to the air outlet end, and the second end is proximal to the air-blocking end, wherein a distance between the first end and the air outlet end is less than or equal to a radius of the connecting end face, and a distance between the second end and the air-blocking end is less than or equal to the radius of the connecting end face.

3. The hair dryer according to claim 2, wherein an air outlet enclosure is disposed at the air outlet end, and a heater assembly, a PCB board and a first mounting frame are disposed within the air outlet enclosure, wherein the first mounting frame is disposed between the heater assembly and the PCB board, the first mounting frame is fixedly connected to the heater assembly and the PCB board, and the heater assembly is disposed proximal to the air outlet end, and,

wherein an air-blocking enclosure is disposed at the air-blocking end and fixedly connected to the first mounting frame.

4. The hair dryer according to claim 3, wherein the PCB board is disposed on a side proximal to the air-blocking end with respect to the second central axis, and,

wherein there are gaps between the first mounting frame and each of the PCB board and the heater assembly, and an end of the heater assembly is located on the side proximal to the air-blocking end with respect to the second central axis.

5. The hair dryer according to claim 4, wherein a control module is disposed on the inner handle housing at an end thereof proximal to the first outer housing, and said control module is recessed in a radial direction of the inner handle housing toward the air outlet end,

wherein the control module comprises a second flow-guiding surface and a third flow-guiding surface, the second flow-guiding surface being located at an end of the control module proximal to the first outer housing, with the PCB board being flush with an end of the second flow-guiding surface proximal to the inner handle housing, and,

wherein the third flow-guiding surface is located at an end of the control module away from the first outer housing.

6. The hair dryer according to claim 5, wherein a flow-guiding member is disposed on the inner handle housing at the end thereof proximal to the first outer housing, wherein said flow-guiding member is relatively proximal to the air outlet end, and the flow-guiding member comprises a first flow-guiding surface having a direction of flow-guiding opposite to that of the second flow-guiding surface so that the cold airflow in the inner handle housing is able to flow over the first flow-guiding surface of the flow-guiding member toward the PCB board, and,

wherein the first mounting frame further comprises a number of first through-holes, which allow the airflow flowing through the PCB board to, by passing

through the first through-holes along the first central axis, flow toward the air outlet end and flow through the heater assembly.

7. The hair dryer according to claim 3, wherein the heater assembly comprises a heating wire assembly, an annular inner shell, an annular outer shell and a second mounting frame, wherein a number of supporting elements, arranged circumferentially around the first central axis, are disposed in the annular inner shell, and the heating wire assembly, arranged circumferentially around the first central axis, are disposed on the respective supporting elements, with the end of the heating wire assembly proximal to the air-blocking end being relatively located on the second central axis, and,

wherein both the annular outer shell and the annular inner shell are disposed on a side of the second mounting frame proximal to the air outlet end, and the annular outer shell is coaxially sleeved over the annular inner shell.

8. The hair dryer according to claim 7, wherein the supporting elements are symmetrical about the second central axis, wherein one of the supporting elements proximal to the inner handle housing is deployed along the second central axis so that the airflow reaching this support element is split into two symmetrical streams flowing toward opposite sides of the heater assembly.

9. The hair dryer according to claim 7, wherein the annular inner shell is sleeved over the second mounting frame on the side thereof proximal to the air outlet end, wherein the second mounting frame comprises securing recesses at locations corresponding to the supporting elements, and the supporting elements are engaged in the securing recesses.

10. The hair dryer according to claim 7, wherein first snap fasteners and first securing structures are disposed at one end of the first mounting frame, wherein the first snap fasteners are clipped onto peripheral edges of the PCB board, and the first

securing structures extend through the PCB board and are fixedly connected to the air-blocking enclosure, and,

wherein second snap fasteners and second securing structures are disposed at the other end of the first mounting frame, wherein the second snap fasteners are clipped onto the second mounting frame, and the second securing structures are fixedly connected to the second mounting frame.

11. The hair dryer according to claim 7, wherein a thermistor and a temperature controller are disposed on the annular inner shell at an end thereof proximal to the air outlet end, said thermistor and said temperature controller being symmetrical with respect to the first central axis and relatively located centrally on left and right sides of an outer circumferential surface of the annular inner shell.

12. The hair dryer according to claim 7, wherein a capacitor is disposed centrally on the PCB board at an end thereof proximal to the air outlet end, wherein said capacitor extends through the first mounting frame and the second mounting frame and into the interior of the annular inner shell, and said capacitor does not protrude out of the annular inner shell.

13. The hair dryer according to claim 1, wherein the inner handle housing comprises a first inner housing and a second inner housing, wherein an annular connecting section is disposed on the first inner housing at an end thereof proximal to the first outer housing, and the annular connecting section is secured to a central portion of the first outer housing, and,

wherein the second outer housing is clipped onto the first outer housing along the first central axis, and said first outer housing is proximal to the air outlet end.

14. The hair dryer according to claim 13, wherein a control module is disposed on the first outer housing in a side thereof proximal to the air-blocking end, wherein the annular connecting section comprises a first plug-in section in a side thereof

proximal to the air outlet end, and a flow-guiding member is inserted into the first plug-in section, and,

wherein an air-blowing assembly is disposed within the first outer housing.

15. The hair dryer according to claim 14, wherein the hair dryer further comprises a second outer housing disposed over the inner handle housing along the second central axis, and,

wherein a hood and an inner filter mesh frame are disposed on the second outer housing at an end thereof away from the first outer housing, and wherein the inner filter mesh frame is clipped onto the first outer housing, and the hood is detachably disposed on the inner filter mesh frame by a magnetically attractive means.