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(54) **PARKING HEATER WITH HIGH ENERGY UTILIZATION RATE**

(57) A parking heater with a high energy utilization rate comprises a shell and a combustion device; the shell comprises an air inlet end, an air outlet end and an air flow channel penetrating the air inlet end and the air outlet end; the combustion device comprises a cylinder block, wherein the cylinder block comprises a combustion chamber, a fuel pipeline, a waste gas pipeline, an input end and an output end, wherein the fuel pipeline is communicated with the combustion chamber, and the output end is communicated with the waste gas pipeline; wherein, the combustion chamber comprises a combustion cylinder, the combustion cylinder has a cylindrical structure varying in axial diameters, the fuel pipeline is continuously molded around the cylindrical structure of the combustion cylinder; wherein, the waste gas pipeline extends to the air inlet end and is continuously formed around an air inlet channel of the air inlet end.

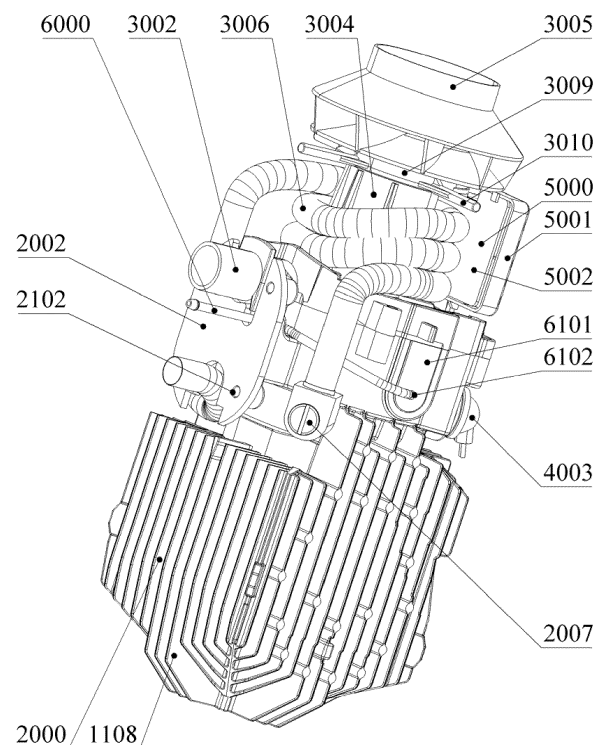


FIG. 4

Description

TECHNICAL FIELD

[0001] The present invention relates to the technical field of parking heaters, in particular to a parking heater with a high energy utilization rate.

BACKGROUND

[0002] Parking heater is an independent auxiliary heating system, which can preheat and raise the temperature of the vehicle without starting the engine, and can also provide auxiliary heating function during driving. The use of parking heaters has many advantages, such as avoiding cold start of vehicles and prolonging the service life of engines, which ensures that fuel economy, improves security and so on. Parking heater is very practical for automobile travel in cold weather, which can not only protect the engine, but also improve the comfort and safety of passengers.

[0003] The parking heater has its own fuel pipeline, circuit, combustion heating device and control device, etc. After the gas enters the parking heater from the air inlet pipe for combustion, the burnt waste gas is directly discharged from the car through the waste gas pipeline, and the nozzle of the waste gas pipeline is arranged on the shell of the parking heater. Since the burnt waste gas has high temperature, the temperature at the nozzle is as high as 400 to 500 degrees, there is a great energy waste problem in this waste gas treatment method. For example, the European patent with the application number of 21735565 has the problem of energy waste, and heating the car is slow; similarly, the European patent with the application number of 0632769 also has the characteristics of low energy utilization rate, which will waste energy and slow heating the car.

[0004] According to the above problems, it is necessary for us to propose a new type of parking heater, which has less energy waste, saves fuel, can effectively raise the temperature inside the car, and provides users with better use experience and more cost-effective parking heater selection.

SUMMARY

[0005] The present invention provides a parking heater with a high energy utilization rate, which includes a shell and a combustion device; the shell comprises at least one air inlet end and at least one air outlet end, and an air flow channel penetrating the air inlet end and the air outlet end; wherein, the combustion device comprises a cylinder block which comprises a combustion chamber, a fuel pipeline, an input end and an output end, wherein the fuel pipeline is communicated with the combustion chamber, the input end defines a channel for air to enter the combustion chamber, and the output end defines a channel for burned waste gas to exit from the combustion

chamber; and

wherein, the combustion chamber comprises a combustion cylinder, and the combustion cylinder has a cylindrical structure varying in axial diameters, wherein the fuel pipeline is continuously molded around the cylindrical structure of the combustion cylinder.

[0006] The present invention also provides a parking heater with a high energy utilization rate, which includes a shell and a combustion device; the shell comprises at least one air inlet end and at least one air outlet end, and an air flow channel penetrating the air inlet end and the air outlet end; wherein, the combustion device comprises a cylinder block which comprises a combustion chamber, a fuel pipeline, a waste gas pipeline, an input end and an output end, wherein the fuel pipeline is communicated with the combustion chamber, the input end defines a channel for air to enter the combustion chamber, the output end defines a channel for burned waste gas to exit from the combustion chamber, and the output end is communicated with the waste gas pipeline; and wherein, the waste gas pipeline extends to the air inlet end and is continuously formed around an air inlet channel of the air inlet end.

BRIEF DESCRIPTION OF DRAWINGS

[0007] In order to explain the technical solution of this application more clearly, the drawings needed in the implementation will be briefly introduced below. Obviously, the drawings described below are only some implementations of this application. For those skilled in the art, other drawings can be obtained according to these drawings without creative work.

FIG. 1 is a schematic view of a parking heater;
FIG. 2 is a schematic view of the shell;
FIG. 3 is a schematic view of the second shell;
FIG. 4 is a schematic view of the parking heater without a shell;
FIG. 5 is an exploded view of the motor assembly;
FIG. 6 is another exploded view of the motor assembly;
FIG. 7 is a schematic diagram of a cylinder block;
FIG. 8 is a schematic diagram of a combustion device;
FIG. 9 is a schematic view of the combustion base.

[0008] In the figures:

1000, Shell; 1001, First shell; 1002, Second shell; 1003, Fixing groove; 1004, Fixing block; 1005, Accommodating groove; 1106, Air inlet end; 1107, Air outlet end; 1108, Heat conducting rib; 1101, Embedding groove; 1102, Sixth fixing hole; 2000, Cylinder block; 2001, Exhaust port; 2002, Pipeline fixing platform; 2003, First groove; 2004, Second groove; 2005, Third groove; 2006, Spare port; 2007, Valve cover; 2008, First sealing ring; 2009, Connecting pipe; 2010, Second sealing ring; 2011, Pipeline groove; 2012, Eighth fixing hole; 2101, Second fixing

hole; 2102, Fifth fixing hole; 3000, Motor assembly; 3001, Motor base; 3002, Air inlet pipe; 3003, Combustion-supporting wind wheel; 3004, Motor; 3005, Auxiliary wind wheel; 3006, Waste gas pipeline; 3007, Motor groove; 3008, Collar part; 3009, Abutment ring; 3010, Support column; 3011, Supporting part; 3101, First fixing hole; 3102, Fourth fixing hole; 3103, Third fixing hole; 3104, Fastening protrusion; 3105, Twelfth fixing hole; 4000, Combustion device; 4001, Combustion base; 4002, Combustion cylinder; 4003, Ignition device; 4004, Guide cover; 4005, Mixed combustion chamber; 4006, Swirl air outlet; 4007, Blade; 4008, Ignition pipeline; 4009, Vent hole; 4010, External thread; 4011, Internal thread; 4012, Combustion chamber; 4013, Input end; 4014, Output end; 4101, Seventh fixing hole; 5000, Control device; 5001, Control panel; 5002, Control backplane; 5101, Ninth fixing hole; 5102, Tenth fixing hole; 5103, Fastening groove; 5104, Eleventh fixing hole; 6000, Fuel pipeline; 6001, Pipeline body; 6002, Delivery end; 6003, Feeding end; 6101, Fitting part; 6102, Pipeline hole.

DESCRIPTION OF EMBODIMENTS

[0009] While various aspects and features of certain embodiments have been summarized above, the following detailed description illustrates a few exemplary embodiments in further detail to enable one skilled in the art to practice such embodiments. Reference will now be made in detail to embodiments of the inventive concept, examples of which are illustrated in the accompanying drawings. The accompanying drawings are not necessarily drawn to scale. The described examples are provided for illustrative purposes and are not intended to limit the scope of the invention. It should be understood, however, that persons having ordinary skill in the art may practice the inventive concept without these specific details.

[0010] It will be understood that, although the terms first, second, etc. may be used herein to describe various elements, these elements should not be limited by these terms. These terms are only used to distinguish one element from another. For example, a first attachment could be termed a second attachment, and, similarly, a second attachment could be termed a first attachment, without departing from the scope of the inventive concept.

[0011] It will be understood that when an element or layer is referred to as being "on," "coupled to," or "connected to" another element or layer, it can be directly on, directly coupled to or directly connected to the other element or layer, or intervening elements or layers may be present. In contrast, when an element is referred to as being "directly on," "directly coupled to," or "directly connected to" another element or layer, there are no intervening elements or layers present. Like numbers refer to like elements throughout. As used herein, the term "and/or" includes any and all combinations of one or more of the associated listed items.

[0012] As used in the description of the inventive concept and the appended claims, the singular forms "a," "an," and "the" are intended to include the plural forms as well, unless the context clearly indicates other.

[0013] As shown in FIGS. 1 to 9, the present invention provides a parking heater with a high energy utilization rate, including a shell 1000 and a combustion device 4000; the shell includes at least one air inlet end 1106 and at least one air outlet end 1107, and an air flow channel running through the air inlet end 1106 and the air outlet end 1107. The combustion device 4000 includes a cylinder block 2000, which includes a combustion chamber 4012, a fuel pipeline 6000, a waste gas pipeline 3006, an input end 4013 and an output end 4014, wherein the fuel pipeline 6000 is communicated with the combustion chamber 4012, the input end 4013 defines a channel for air to enter the combustion chamber 4012, and the output end 4014 defines a channel for burned waste gas to exit from the combustion chamber 4012. The combustion chamber 4012 includes a combustion cylinder 4002, which has a cylindrical structure varying in axial diameters, and the fuel pipeline 6000 is continuously molded around the cylindrical structure of the combustion cylinder 4002; the waste gas pipeline 3006 extends to the air inlet end 1106 and is continuously formed around the air inlet channel of the air inlet end 1106.

[0014] In this embodiment, the combustion cylinder 4002 is arranged in a cylindrical shape. In other embodiments (not shown in the figures), the combustion cylinder can also be set to a triangle, an ellipse, a rectangle, a polygon, and any desirable geometric shape.

[0015] In this embodiment, the waste gas pipeline 3006 is wound on the motor 3004. In other embodiments (not shown in the figures), the waste gas pipeline is not limited to being wound on the motor assembly, but can also be arranged to be bent and wound at any position in the shell corresponding to the air inlet end.

[0016] In this embodiment, the waste gas pipeline 3006 and the fuel pipeline 6000 are arranged as circular pipes. In other embodiments (not shown in the figures), the waste gas pipeline and the fuel pipeline are not limited to circular pipelines, but can also be set to triangle, ellipse, rectangle, polygon and any arbitrary geometric shape as desirable.

[0017] As shown in FIGS. 4 to 8, in this embodiment, the combustion chamber 4012 includes a combustion base 4001, a combustion cylinder 4002 sleeved on the upper end of the combustion base, and an ignition device 4003 installed on the combustion base 4001. One end of the combustion cylinder 4002 is communicated with the combustion base 4001, and the other end of the combustion cylinder 4002 is opened; the combustion base 4001 is communicated with the air inlet pipe 3002, the fuel pipeline 6000 includes a pipeline body 6001 wound on the combustion cylinder 4002, a delivery end 6002 connected with the ignition device, and a feeding end 6003 located outside the shell.

[0018] In some embodiments (not shown in the fig-

ures), a flame screen is arranged at the opening to prevent the flame from overflowing; a temperature sensor is also arranged at the opening to detect the flame temperature and feed it back to the control device; a plurality of nozzles are arranged on the pipeline body, and the nozzles face the inside of the combustion cylinder and are evenly distributed along the axial direction of the combustion cylinder; the delivery end is provided with a valve and a pump to control and deliver fuel; a filter and a storage tank are arranged on the feeding end to filter and store the fuel.

[0019] In some embodiments (not shown in the figures), an igniter and an ignition circuit are arranged in the ignition device. The igniter includes an electrode and an insulating sleeve. The electrode passes through the vent hole of the ignition pipeline and extends into the mixed combustion chamber. The insulating sleeve wraps the electrode and is closely connected with the ignition pipeline. The ignition circuit includes a power supply, a switch, a transformer and a capacitor, wherein the power supply is connected with the switch, the transformer and the capacitor in turn, and the output end of the transformer is connected with the electrode.

[0020] As shown in FIGS. 4 to 9, in this embodiment, a guide cover 4004 with a gas inlet cavity is arranged in the combustion base 4001, a mixed combustion chamber 4005 is formed between the outer surface of the guide cover 4004 and the inner wall of the combustion base 4001, a plurality of swirl air outlets 4006 are arranged at intervals on the surface of the guide cover 4004, and a plurality of blades 4007 are arranged at the lower end of the combustion base 4001 in a vortex shape along the cavity opening of the gas inlet cavity. An ignition pipe 4008 for installing the ignition device 4003 is arranged in the combustion base 4001, wherein the ignition pipe 4008 is communicated with the mixed combustion chamber 4005, and the fuel pipeline 6000 is communicated with the ignition pipe 4008, wherein the ignition pipe 4008 is provided with a vent hole 4009.

[0021] As shown in FIGS. 4 to 7, in this embodiment, a motor assembly 3000 is connected to the cylinder block 2000, and a control device 5000 is provided on the motor assembly 3000; the motor assembly 3000 includes a motor base 3001 connected to the cylinder block 2000, an air inlet pipe 3002 with one end passing through the shell 1000; a combustion-supporting wind wheel 3003 is provided at one end of the motor base 3001 facing the combustion device 4000, a motor 3004 is provided at the other end of the motor base 3001, and an auxiliary wind wheel 3005 is provided at one end of the motor 3004 far from the motor base 3001; a waste gas pipeline 3006 is wound around the motor 3004, one end of the waste gas pipeline 3006 is connected with the exhaust port 2001 provided on the cylinder block 2000, and the other end of the waste gas pipeline 3006 is communicated with the outside through the shell 1000. The cylinder block 2000 is provided with a plurality of heat conducting ribs 1108 to increase the contact area between air and the cylinder

and improve the heating efficiency.

[0022] In some embodiments (not shown in the figures), a filter screen and an anti-freezing device are arranged inside the air inlet pipe to filter impurities in the air and prevent water vapor from condensing; an adjusting valve is arranged between the air inlet pipe and the combustion-supporting wind wheel to control the air flow entering the combustion-supporting wind wheel; a sound insulation layer and a vibration isolation layer are arranged between the combustion-supporting wind wheel and the cylinder block to reduce noise and vibration; a heat exchanger is arranged between the auxiliary wind wheel and the shell, so that the shell is cooled by the air blown by the auxiliary wind wheel, and the air is preheated and sent into the air flow channel; a plurality of spiral guide vanes are arranged inside the heat exchanger to increase the contact area and time between air and the surface of the heat exchanger.

[0023] Wherein, the control device is provided with a microprocessor, a display screen, keys, a temperature sensor, a pressure sensor, a flow sensor and other elements, wherein the microprocessor is respectively connected with the display screen, keys, the temperature sensor, the pressure sensor, the flow sensor and other elements to realize parameter setting, monitoring and control of the parking heater.

[0024] As shown in FIG. 7, in this embodiment, one side of the cylinder block 2000 is provided with a pipeline fixing platform 2002, and the pipeline fixing platform 2002 is provided with a first groove 2003 for fixing the waste gas pipeline 3006, a second groove 2004 for fixing the air inlet pipe 3002 and a third groove 2005 for fixing the fuel pipeline 6000. In other embodiments (not shown in the figures), it is not limited to fixing the pipeline through the groove, but it can also be provided as a through hole.

[0025] As shown in FIG. 8, in this embodiment, the ignition device 4003 is provided with external threads 4010, and the ignition pipe 4008 is internally provided with internal threads 4011 which are matched with the ignition device 4003, and the ignition device 4003 and the fire pipe are detachably connected by threaded connection. In other embodiments (not shown in the figures), the ignition device and the fire pipe are not limited to being detachably connected by threaded connection, but can also be configured as screw connection, pin connection, rivet connection, pin connection, welding and any desirable connection mode.

[0026] As shown in FIGS. 1 to 3, in this embodiment, the shell 1000 includes a first shell 1001 and a second shell 1002 corresponding to the first shell 1001; wherein, the first shell 1001 is provided with at least one fixing groove 1003, and the second shell 1002 is provided with at least one fixing block 1004 corresponding to the fixing groove 1003; the first shell 1001 and the second shell 1002 are detachably connected through the fixing groove 1003 and the fixing block 1004. In other embodiments (not shown in the figures), the first shell and the second shell are not limited to being detachably connected

through the fixing groove and the fixing block, but can also be configured as screw connection, pin connection, rivet connection, pin connection, welding and any other desirable connection mode.

[0027] As shown in FIGS. 4 to 7, in this embodiment, at least one first fixing hole 3101 is provided on the motor base 3001, and at least one second fixing hole 2101 corresponding to the first fixing hole 3101 is provided on the cylinder block 2000, wherein the motor base 3001 and the cylinder block 2000 are fixedly connected through a first fixing piece. In this embodiment, the first fixing member is provided as a screw. In other embodiments (not shown in the figures), the motor base and the cylinder block are not limited to being fixedly connected by screws, but can also be connected by pins, rivets, pins, welding and any other desirable connection methods.

[0028] As shown in FIGS. 2 to 7, in this embodiment, the first shell 1001 is provided with an accommodating groove 1005 for accommodating the pipeline fixing platform 2002, wherein the pipeline fixing platform 2002 is provided with at least one fifth fixing hole 2102, and the accommodating groove 1005 is provided with at least one sixth fixing hole 1102 corresponding to the fifth fixing hole 2102. In this embodiment, the third fixing member is provided as a screw. In other embodiments (not shown in the figures), the first shell and the pipeline fixing platform are not limited to being fixedly connected by screws, but can also be configured as pin connection, rivet connection, pin connection, welding and any other desirable connection methods.

[0029] As shown in FIGS. 4 to 7, in this embodiment, a motor groove 3007 is formed on the motor base 3001, and the motor 3004 is arranged in the motor groove 3007; at least one third fixing hole 3103 is provided on the motor base 3001, and at least one fourth fixing hole 3102 corresponding to the third fixing hole 3103 is provided on the motor base 3001; the motor base 3001 and the motor 3004 are connected by a second fixing piece. In this embodiment, the second fixing member is provided as a screw. In other embodiments (not shown in the figures), the motor base and the motor are not limited to being fixedly connected by screws, but can also be configured as pin connection, rivet connection, pin connection, welding and any other desirable connection methods.

[0030] As shown in FIGS. 4 to 7, in this embodiment, the motor base 3001 is further provided with a collar part 3008, an abutment ring 3009 is provided on the collar part 3008, and a plurality of support columns 3010 abutting on the shell 1000 are provided on the abutment ring 3009; wherein the motor base 3001 is also provided with a supporting part 3011, the first shell 1001 is provided with an embedding groove 1101 corresponding to the supporting part 3011, and the supporting part 3011 is arranged in the embedding groove 1101.

[0031] As shown in FIGS. 4 to 7, in this embodiment, the control device 5000 includes a control panel 5001 and a control backplane 5002 corresponding to the control

panel 5001, wherein the control panel 5001 is provided with at least one ninth fixing hole 5101, and the control backplane 5002 is provided with at least one tenth fixing hole 5102 corresponding to the ninth fixing hole 5101; the control panel 5001 and the control backplane 5002 are fixedly connected by a fifth fixing piece. In this embodiment, the fifth fixing member is provided as a screw. In other embodiments (not shown in the figures), the control panel and the control backboard are not limited to being fixedly connected by screws, but can also be configured to be connected by pins, rivets, pins, welding and any desirable connection mode.

[0032] As shown in FIGS. 4 to 7, in this embodiment, the control panel 5001 is provided with a fastening groove 5103 and an eleventh fixing hole 5104, and the motor base 3001 is provided with a fastening protrusion 3104 corresponding to the fastening groove 5103 and a twelfth fixing hole 3105 corresponding to the eleventh fixing hole 5104; the control panel 5001 and the motor base 3001 are fixedly connected by fastening connection and screw connection. In other embodiments (not shown in the figures), the control panel and the motor base are not limited to being fixedly connected by fastening connection and screw connection, but can also be configured as pin connection, rivet connection, pin connection, welding and any other desirable connection methods.

[0033] As shown in FIGS. 5 to 7, in this embodiment, a spare port 2006 is provided on the cylinder block 2000, a valve cover 2007 is provided on the spare port 2006, and a first sealing ring 2008 is provided on the valve cover 2007, which can effectively prevent gas leakage; a connecting pipe 2009 corresponding to the waste gas pipeline 3006 and the exhaust port 2001 is arranged between the waste gas pipeline 3006 and the exhaust port 2001; a second sealing ring 2010 is arranged on the connecting pipe 2009, and the second sealing ring 2010 can effectively isolate the waste gas from the outside air.

[0034] As shown in FIG. 7, in this embodiment, the cylinder block 2000 is provided with a pipeline groove 2011, a fitting part 6101 is provided on the pipeline groove 2011, and a pipeline hole 6102 corresponding to the fuel pipeline 6000 is provided on the fitting part 6101, and the fuel pipeline 6000 passes through the pipeline hole 6102.

[0035] As shown in FIGS. 7 to 8, in this embodiment, the combustion base 4001 is provided with at least one seventh fixing hole 4101, and the cylinder block 2000 is provided with at least one eighth fixing hole 2012 corresponding to the seventh fixing hole 4101, and the combustion base 4001 and the cylinder block 2000 are fixedly connected through a fourth fixing piece. In this embodiment, the fourth fixing member is provided as a screw. In other embodiments (not shown in the figures), the combustion base and the cylinder block are not limited to being fixedly connected by screws, but also can be connected by pins, rivets, pins, welding and any other desirable connection methods.

[0036] When the parking heater works, fuel enters the combustion device from the fuel pipeline, the combus-

tion-supporting wind wheel works to suck oxygen from the air inlet pipe into the combustion device, and the heat generated by the fuel burning in the combustion device heats the cylinder; cold air enters the interior from the air inlet end of the shell, and is heated after passing through the cylinder, and the heated hot air enters the cab from the air outlet end of the shell, and the waste gas generated by combustion is discharged from the waste gas pipeline; the waste gas pipeline is wound on the motor, so that the exhaust path of the waste gas is lengthened, and the auxiliary wind wheel has enough time to blow the heat carried on the waste gas pipe to the cylinder body, and improve the utilization rate of energy. In addition, when the fuel burns in the combustion chamber, the combustion cylinder is heated, and the fuel pipeline wound on the combustion cylinder is heated up accordingly. When the temperature of the combustion cylinder reaches the temperature that can gasify the fuel, the fuel in the fuel pipeline gasifies and enters the combustion chamber for combustion in a gasified state, so that the combustion degree of the fuel in the gasified state is more sufficient, and the energy utilization rate is improved.

[0037] The technical means disclosed in the solution of the present invention are not limited to the technical means disclosed in the above embodiments, but also include the technical solution composed of any combination of the above technical features. It should be pointed out that for those skilled in the art, several improvements and embellishments can be made without departing from the principle of the present invention, and these improvements and embellishments are also regarded as the protection scope of the present invention

Claims

1. A parking heater with a high energy utilization rate, comprising:

a shell and a combustion device; and
wherein, the shell comprises at least one air inlet end and at least one air outlet end, and an air flow channel penetrating the air inlet end and the air outlet end; and

wherein, the combustion device comprises a cylinder block which comprises a combustion chamber, a fuel pipeline, an input end and an output end, wherein the fuel pipeline is communicated with the combustion chamber, the input end defines a channel for air to enter the combustion chamber, and the output end defines a channel for burned waste gas to exit from the combustion chamber; and

wherein, the combustion chamber comprises a combustion cylinder, and the combustion cylinder has a cylindrical structure varying in axial diameters, wherein the fuel pipeline is continuously molded around the cylindrical structure of

the combustion cylinder.

2. The parking heater with a high energy utilization rate according to claim 1, wherein a motor assembly is connected to the cylinder block, and a control device is arranged on the motor assembly; and
wherein, the motor assembly comprises a motor base connected with the cylinder block, an air inlet pipe with one end passing through the shell is arranged on the motor base, a combustion-supporting wind wheel is arranged at one end of the motor base facing the combustion device, a motor is arranged at the other end of the motor base, and an auxiliary wind wheel is arranged at one end of the motor far away from the motor base, wherein a waste gas pipeline is wound on the motor, and one end of the waste gas pipeline is connected with an exhaust port arranged on the cylinder block, and the other end of the waste gas pipeline passes through the shell and is communicated with the outside.
3. The parking heater with a high energy utilization rate according to claim 1, wherein the combustion chamber comprises a combustion base, a combustion cylinder sleeved on the upper end of the combustion base, and an ignition device installed on the combustion base; and one end of the combustion cylinder is communicated with the combustion base, and the other end of the combustion cylinder is opened, and the combustion base is communicated with the air inlet pipe; and the fuel pipeline comprises a pipeline body wound on the combustion cylinder, a delivery end connected with the ignition device, and a feeding end positioned outside the shell.
4. The parking heater with a high energy utilization rate according to claim 3, wherein a guide cover with a gas inlet cavity is arranged in the combustion base, and a mixed combustion chamber is formed between an outer surface of the guide cover and the inner wall of the combustion base; and a plurality of swirl air outlets are arranged at intervals on the surface of the guide cover; and a plurality of blades distributed in a swirl shape along a cavity opening of the gas inlet cavity are arranged at a lower end of the combustion base; and an ignition pipeline for installing the ignition device is arranged in the combustion base, the ignition pipeline is communicated with the mixed combustion chamber, and the fuel pipeline is communicated with the ignition pipeline, wherein the ignition pipeline is provided with a vent hole.
5. The parking heater with a high energy utilization rate according to claim 1, wherein the cylinder block comprises a waste gas pipeline, wherein the waste gas pipeline extends to the air inlet end and is continuously formed around the air inlet channel of the air inlet end.

6. A parking heater with a high energy utilization rate, comprising a shell and a combustion device; and

wherein, the shell comprises at least one air inlet end and at least one air outlet end, and an air flow channel penetrating the air inlet end and the air outlet end; and

wherein, the combustion device comprises a cylinder block which comprises a combustion chamber, a fuel pipeline, a waste gas pipeline, an input end and an output end, wherein the fuel pipeline is communicated with the combustion chamber, the input end defines a channel for air to enter the combustion chamber, the output end defines a channel for burned waste gas to exit from the combustion chamber, and the output end is communicated with the waste gas pipeline; and

wherein, the waste gas pipeline extends to the air inlet end and is continuously formed around an air inlet channel of the air inlet end.

7. The parking heater with a high energy utilization rate according to claim 6, wherein the combustion chamber comprises a combustion cylinder with a cylindrical structure varying in axial diameters, wherein the fuel pipeline is continuously molded around the cylindrical structure of the combustion cylinder; and

wherein, the combustion chamber comprises a combustion base, a combustion cylinder sleeved at an upper end of the combustion base, and an ignition device installed on the combustion base; and one end of the combustion cylinder is communicated with the combustion base, the other end of the combustion cylinder is open, and the combustion base is communicated with an air inlet pipe; and the fuel pipeline comprises a pipeline body wound on the combustion cylinder, a conveying end connected with the ignition device and a feeding end positioned outside the shell; and

wherein, a guide cover with a gas inlet cavity is arranged in the combustion base, a mixed combustion cavity is formed between an outer surface of the guide cover and an inner wall of the combustion base; and a plurality of swirl air outlets are arranged at intervals on the surface of the guide cover, a plurality of blades distributed in a vortex shape along a cavity opening of the gas inlet cavity are arranged at a lower end of the combustion base, and an ignition pipeline for installing the ignition device is arranged in the combustion base, wherein the ignition pipeline is communicated with the mixed combustion cavity and the fuel pipeline is communicated with the ignition pipeline.

8. The parking heater with a high energy utilization rate according to claim 6, wherein a motor assembly is connected to the cylinder block, and a control device is arranged on the motor assembly; and

wherein, the motor assembly comprises a motor base connected with the cylinder block, an air inlet pipe with one end passing through the shell is arranged on the motor base; and a combustion-supporting wind wheel is arranged at one end of the motor base facing the combustion device, and a motor is arranged at the other end of the motor base; and an auxiliary wind wheel is arranged at one end of the motor far away from the motor base, wherein said waste gas pipeline is wound on the motor, and one end of the waste gas pipeline is connected with an exhaust port arranged on the cylinder block, and the other end of the waste gas pipeline passes through the shell and is communicated with the outside.

9. The parking heater with a high energy utilization rate according to claim 6, wherein one side of the cylinder block is provided with a pipeline fixing platform, and the pipeline fixing platform is provided with a first groove for fixing the waste gas pipeline, a second groove for fixing the air inlet pipe and a third groove for fixing the fuel pipeline.

10. The parking heater with a high energy utilization rate according to claim 7, wherein the ignition device is provided with external threads, and the ignition pipeline is internally provided with internal threads matched with the ignition device, and the ignition device and the ignition pipeline are connected by threads.

11. The parking heater with a high energy utilization rate according to claim 9, wherein the shell comprises a first shell and a second shell corresponding to the first shell; and wherein, the first shell is provided with at least one fixing groove, and the second shell is provided with at least one fixing block corresponding to the fixing groove, and the first shell and the second shell are detachably connected with the fixing block through the fixing groove.

12. The parking heater with a high energy utilization rate according to claim 8, wherein at least one first fixing hole is arranged on the motor base, and at least one second fixing hole corresponding to the first fixing hole is arranged on the cylinder block, wherein the motor base and the cylinder block are fixedly connected through a first fixing piece.

13. The parking heater with a high energy utilization rate according to claim 8, wherein a motor groove is formed on the motor base, and the motor is arranged in the motor groove; and at least one third fixing hole is arranged on the motor, and at least one fourth

fixing hole corresponding to the third fixing hole is arranged on the motor base, and the motor base and the motor are fixedly connected through a second fixing piece.

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14. The parking heater with a high energy utilization rate according to claim 11, wherein the first shell is provided with an accommodating groove for accommodating the pipeline fixing platform, wherein the pipeline fixing platform is provided with at least one fifth fixing hole, and the accommodating groove is provided with at least one sixth fixing hole corresponding to the fifth fixing hole, and the first shell and the pipeline fixing platform are fixedly connected through a third fixing piece.

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15. The parking heater with a high energy utilization rate according to claim 7, wherein at least one seventh fixing hole is arranged on the combustion base, and at least one eighth fixing hole corresponding to the seventh fixing hole is arranged on the cylinder block, and the combustion base and the cylinder block are fixedly connected through a fourth fixing piece.

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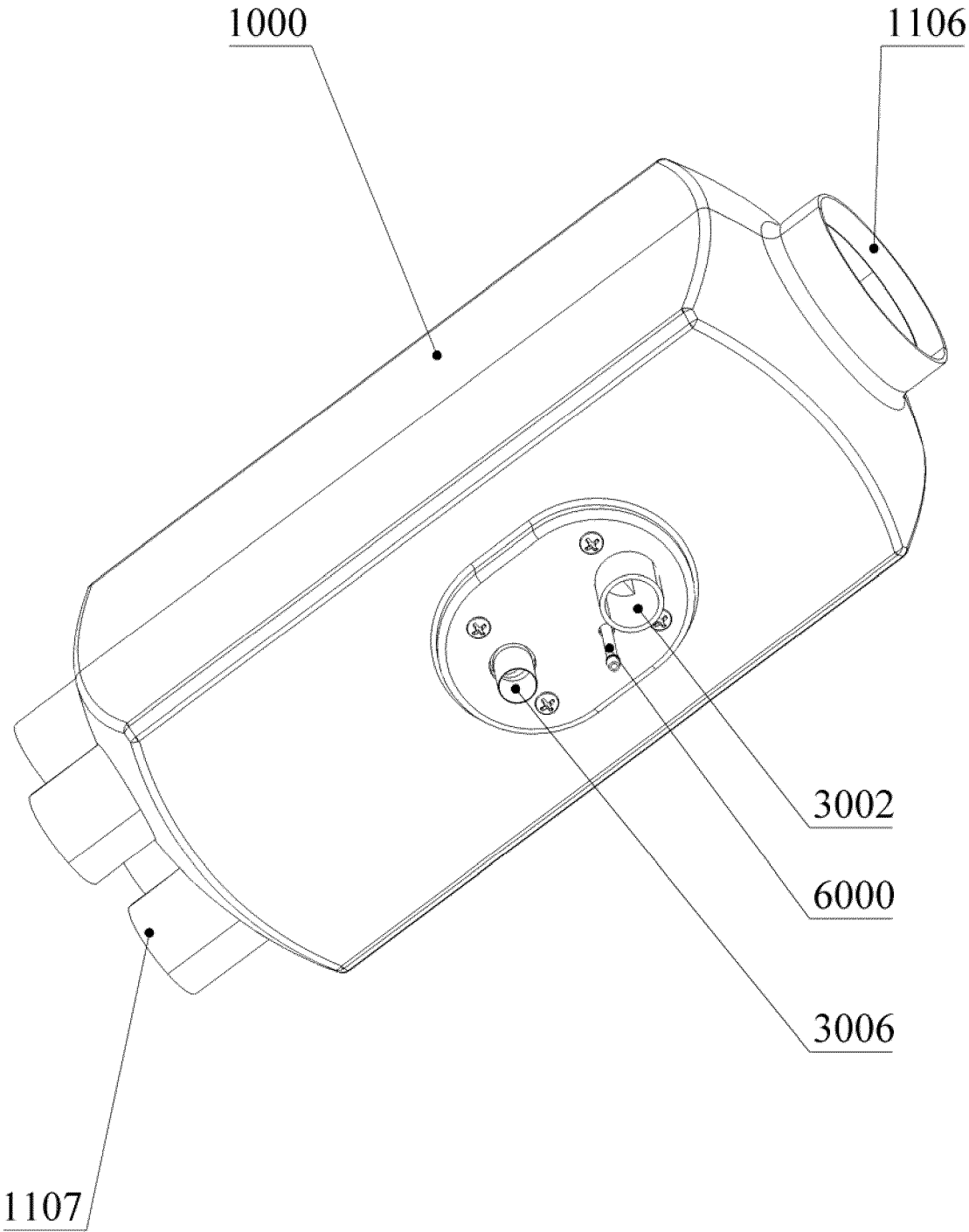


FIG. 1

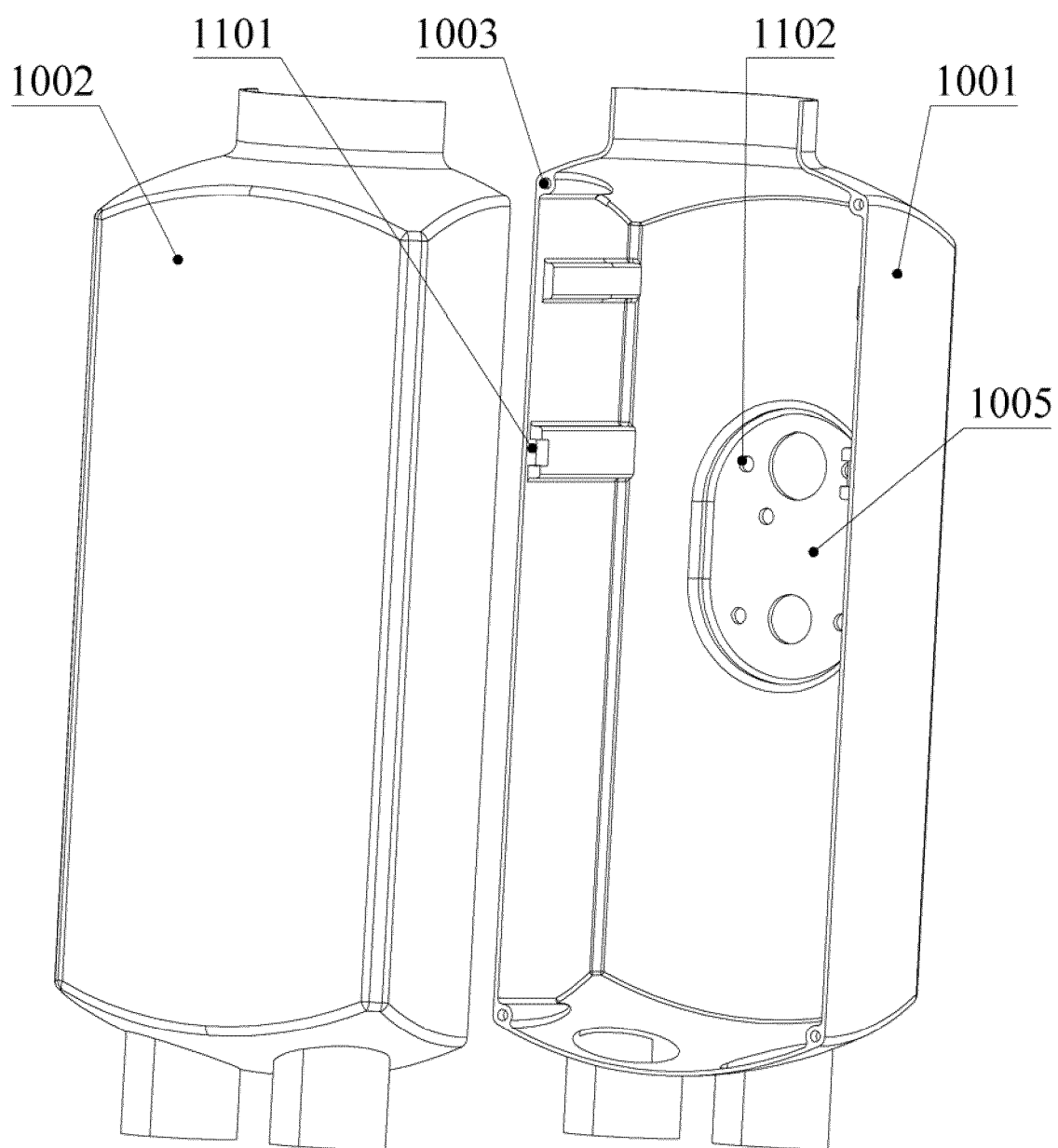


FIG. 2

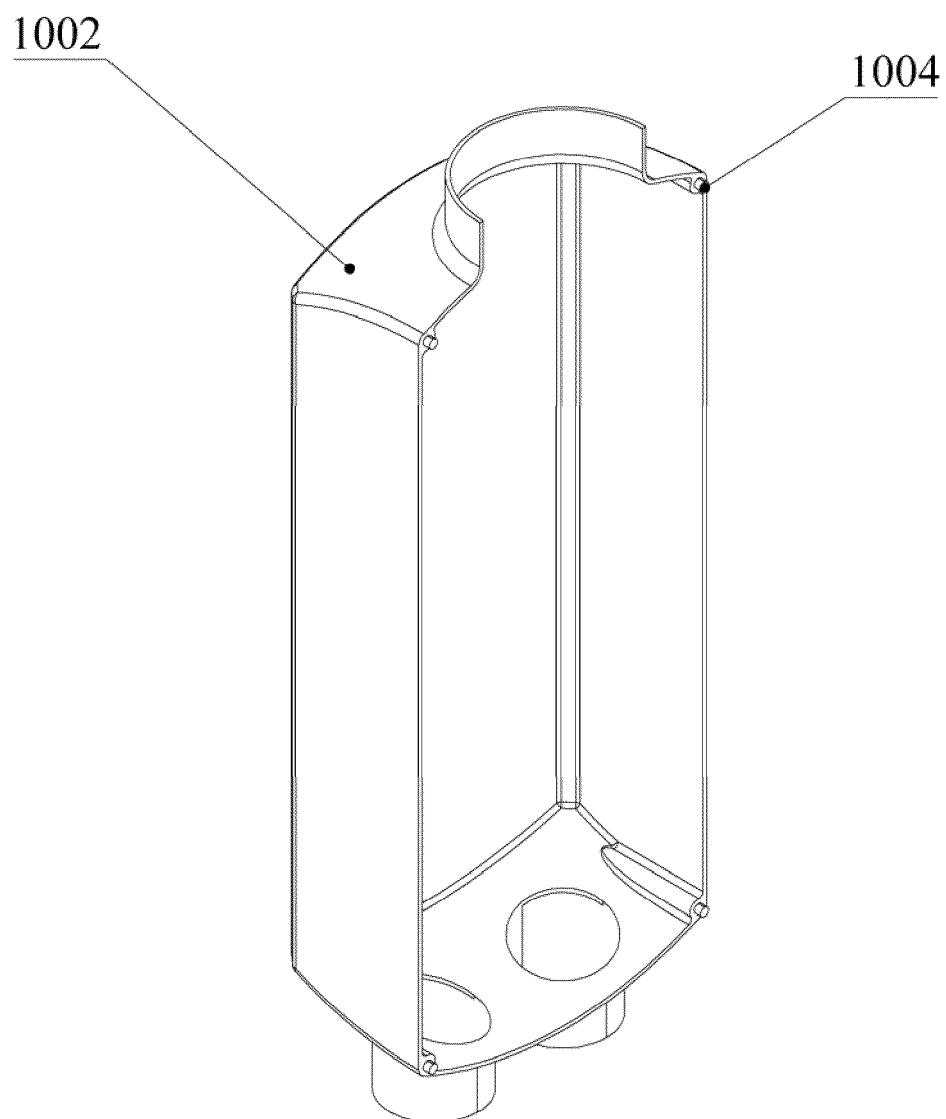


FIG. 3

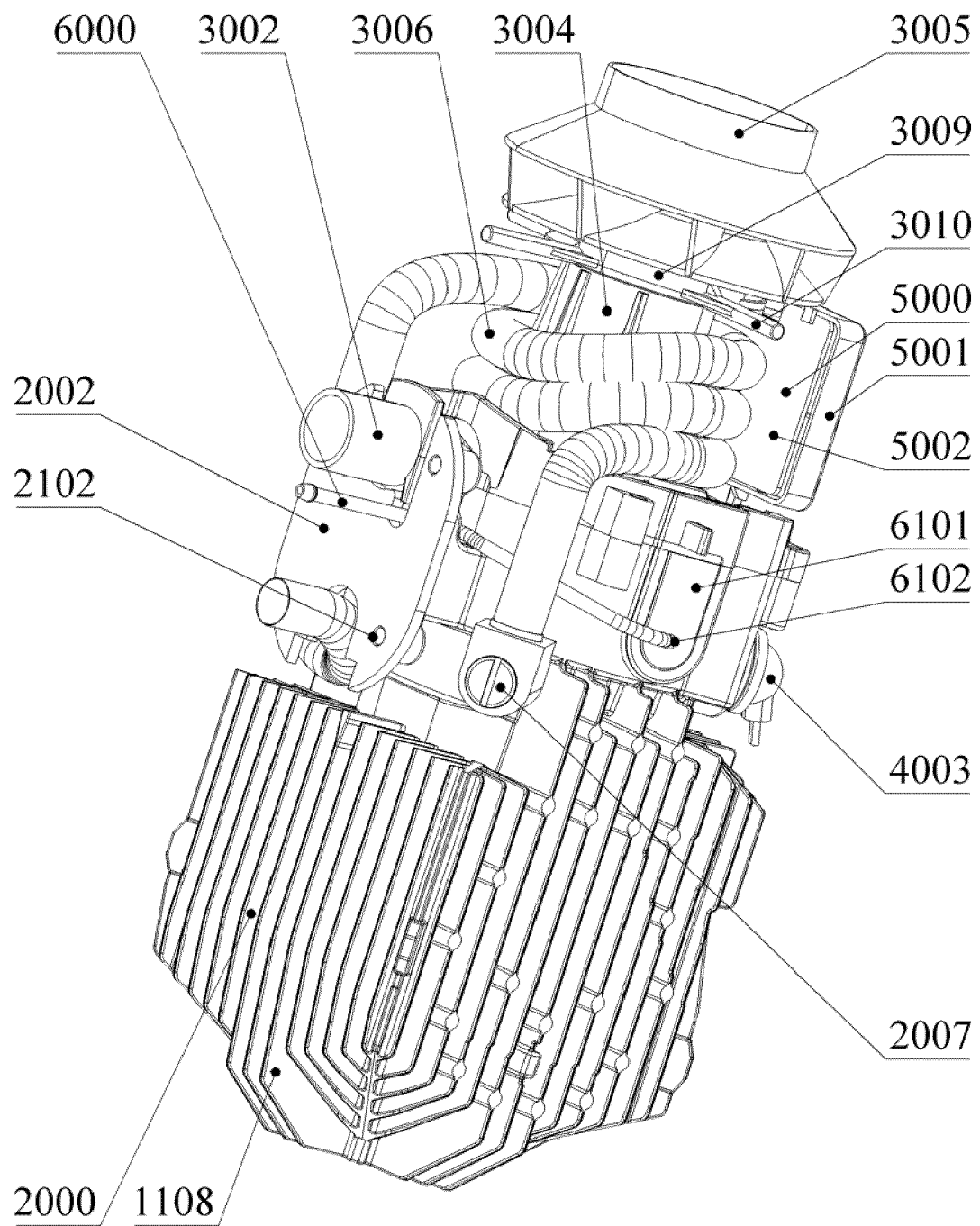


FIG. 4

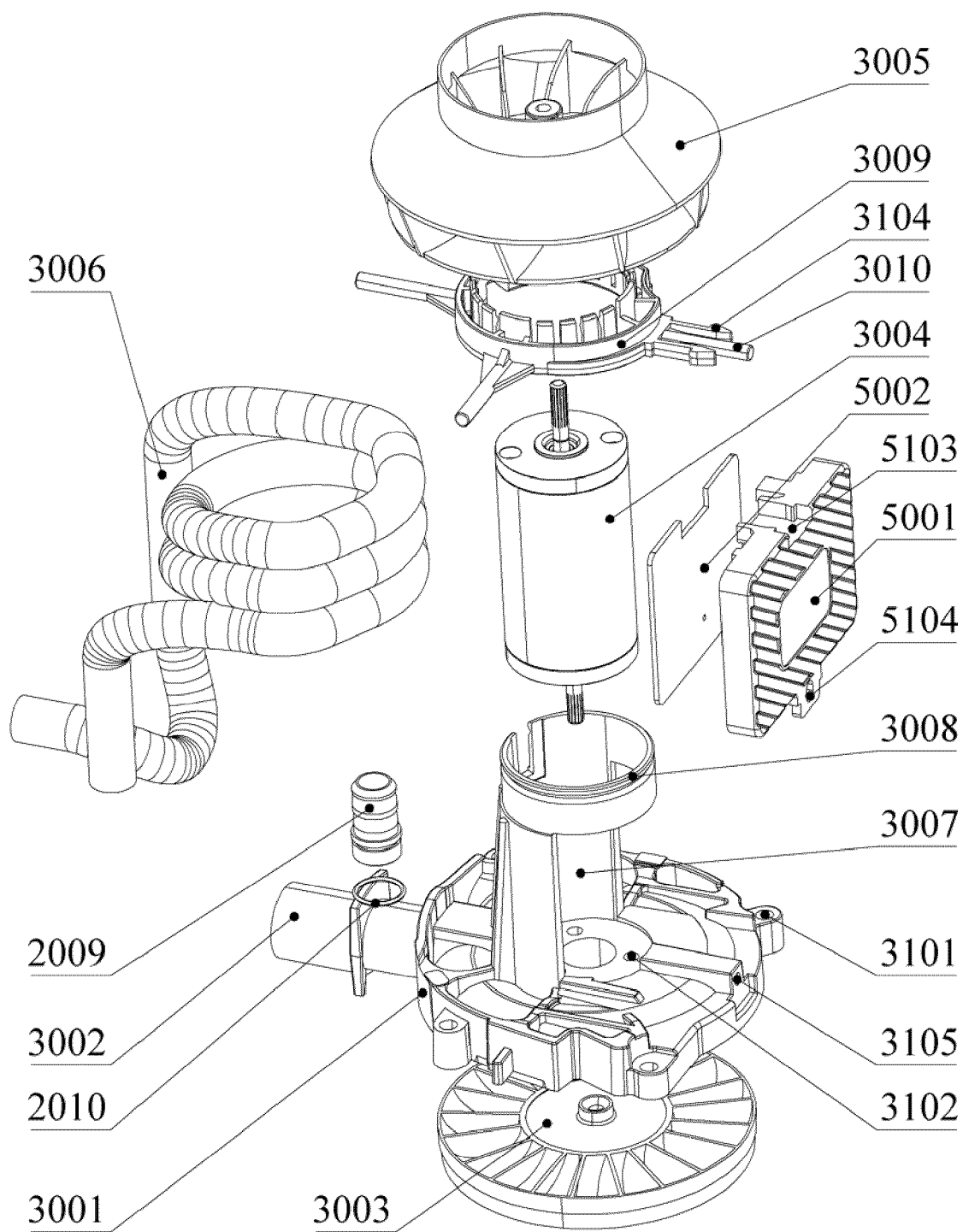


FIG. 5

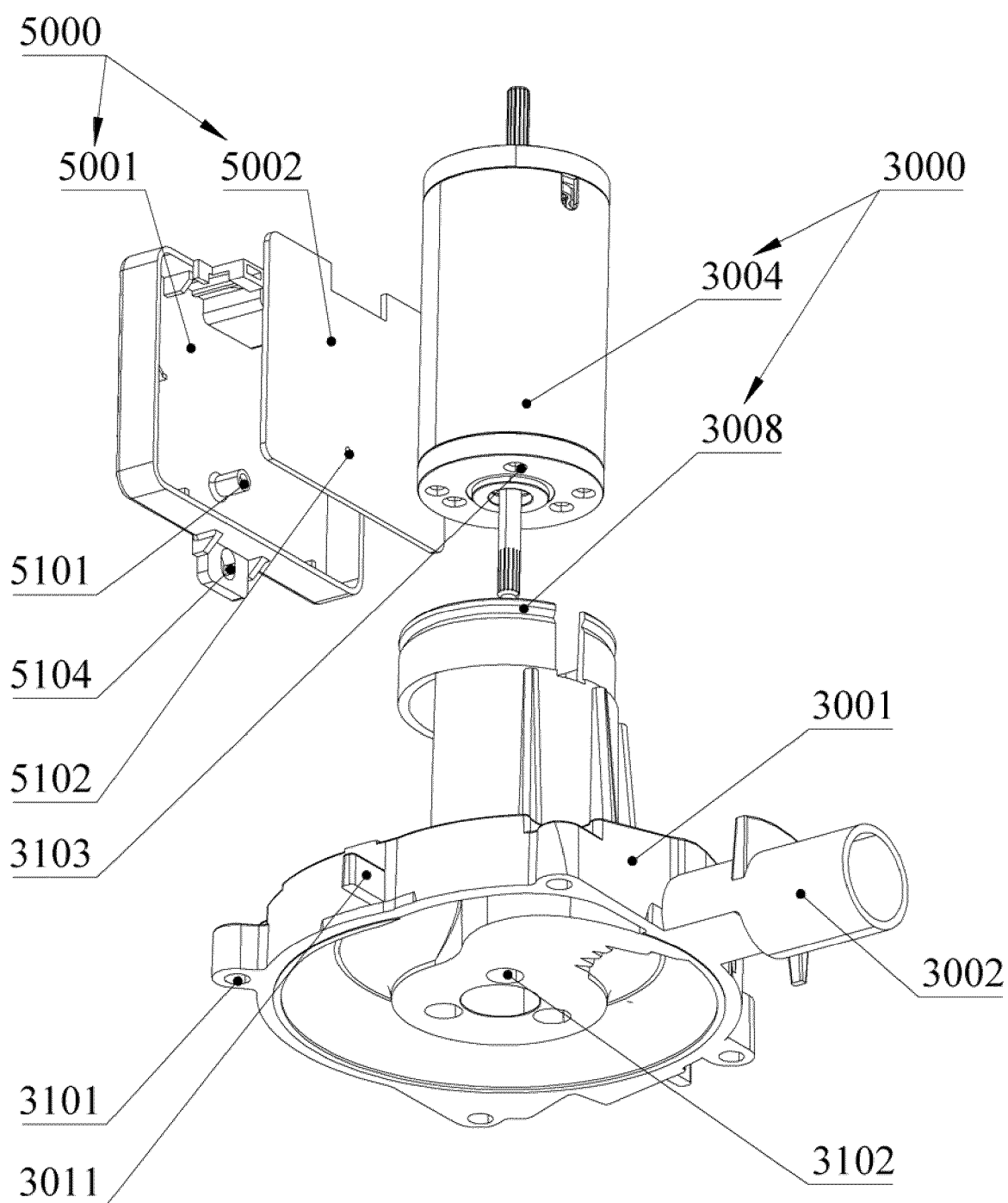


FIG. 6

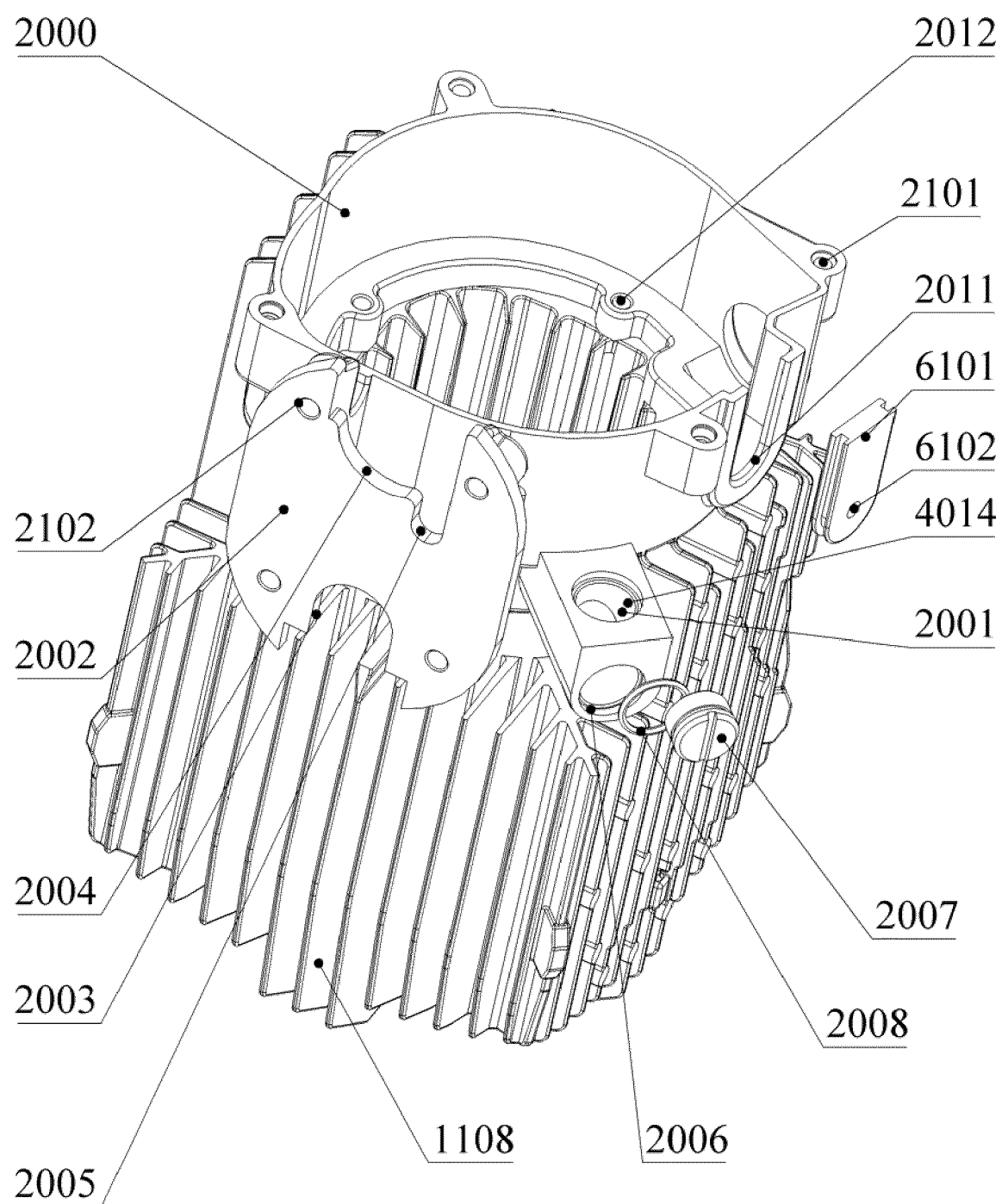


FIG. 7

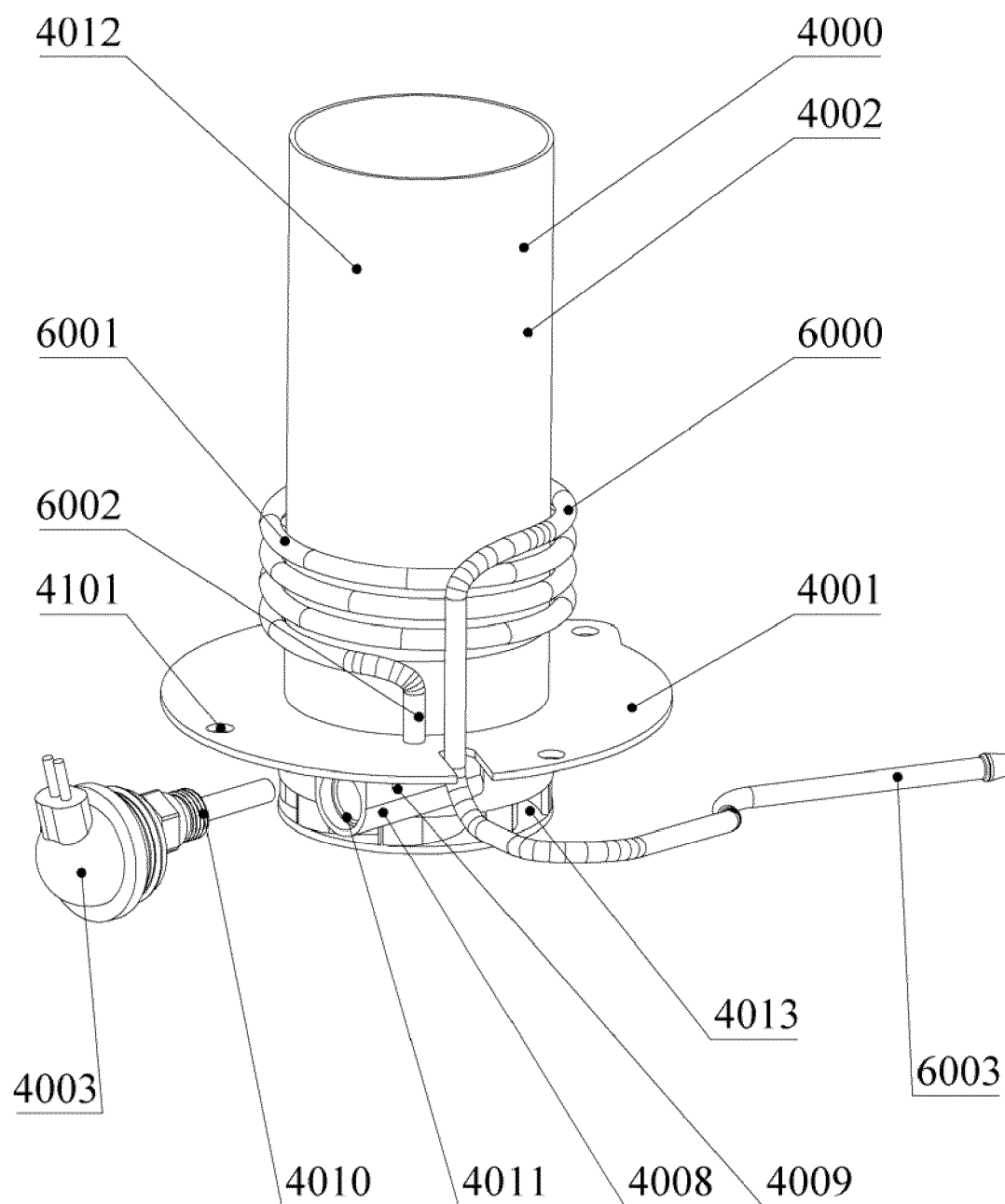


FIG. 8

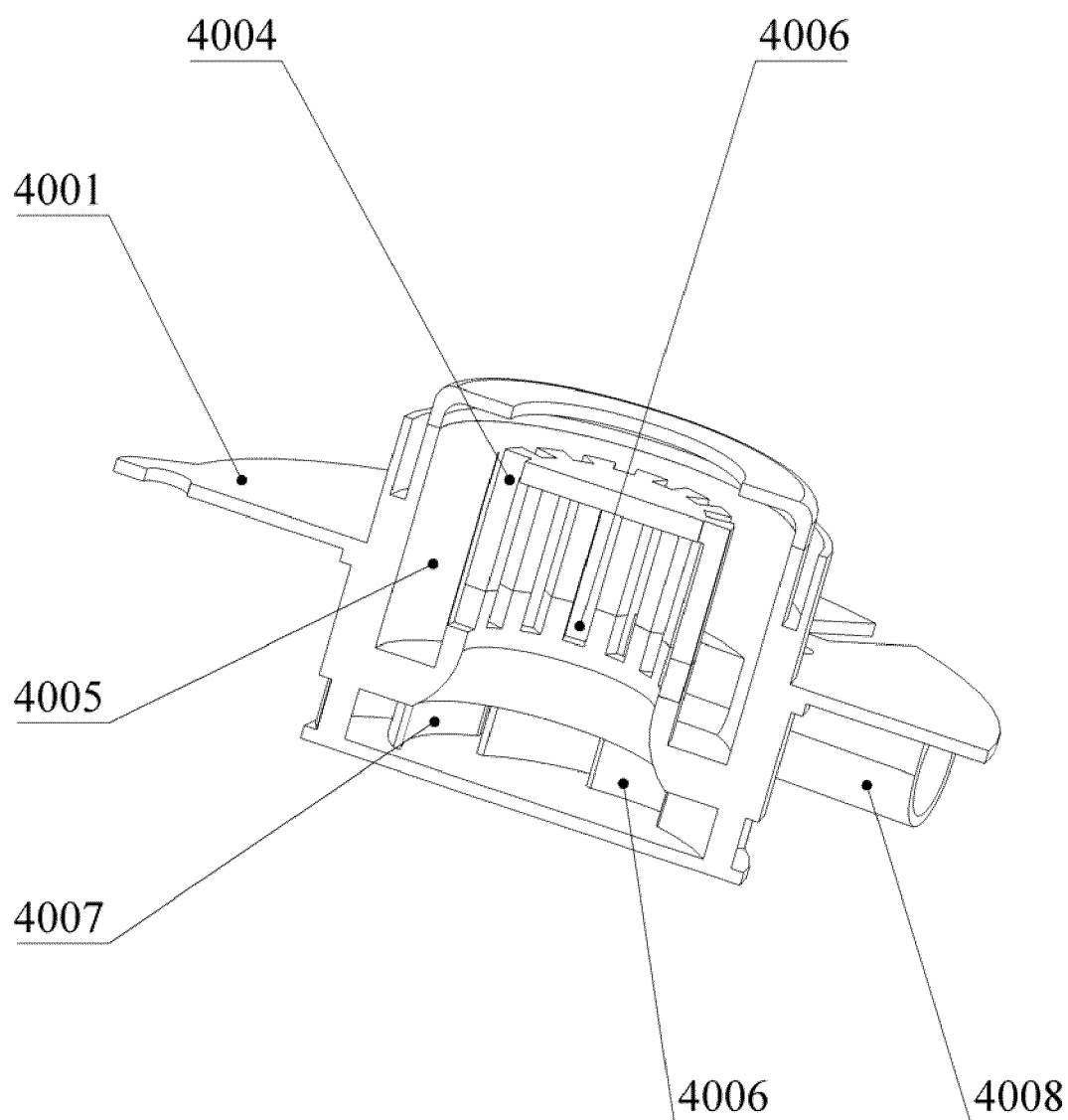


FIG. 9



PARTIAL EUROPEAN SEARCH REPORT

Application Number

under Rule 62a and/or 63 of the European Patent Convention.
This report shall be considered, for the purposes of
subsequent proceedings, as the European search report

EP 23 21 0801

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	CN 218 948 884 U (WENZHOUS CHENGCHEN ELECTRONICS CO LTD) 2 May 2023 (2023-05-02)	6 - 10	INV. F23D3/40 F23D11/44 F23J15/06
A	* Machine Translated by EPO; whole document. *	11 - 15	
A	DE 32 33 321 A1 (WEBASTO WERK BAIER KG W [DE]) 8 March 1984 (1984-03-08) * page 6, paragraph 1 - page 7, last paragraph * * figure 1 *	6	
			TECHNICAL FIELDS SEARCHED (IPC)
			F23D F23J
INCOMPLETE SEARCH			
The Search Division considers that the present application, or one or more of its claims, does/do not comply with the EPC so that only a partial search (R.62a, 63) has been carried out.			
Claims searched completely :			
Claims searched incompletely :			
Claims not searched :			
Reason for the limitation of the search:			
see sheet C			
Place of search		Date of completion of the search	Examiner
Munich		15 July 2024	Gavriliu, Costin
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document			
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EPO FORM 1503 03.82 (P04E07)

INCOMPLETE SEARCH
SHEET C

Application Number

EP 23 21 0801

Claim(s) completely searchable:

6-15

Claim(s) not searched:

1-5

Reason for the limitation of the search:

Following the invitation pursuant to Rule 62a(1) EPC, the applicant indicated that the search is to be carried out based on the independent claim 6.

ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.

EP 23 21 0801

5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
The members are as contained in the European Patent Office EDP file on
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15 - 07 - 2024

10	Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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