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(54) **MOTOR DEVICE WITH HEAT DISSIPATING CAPABILITY**

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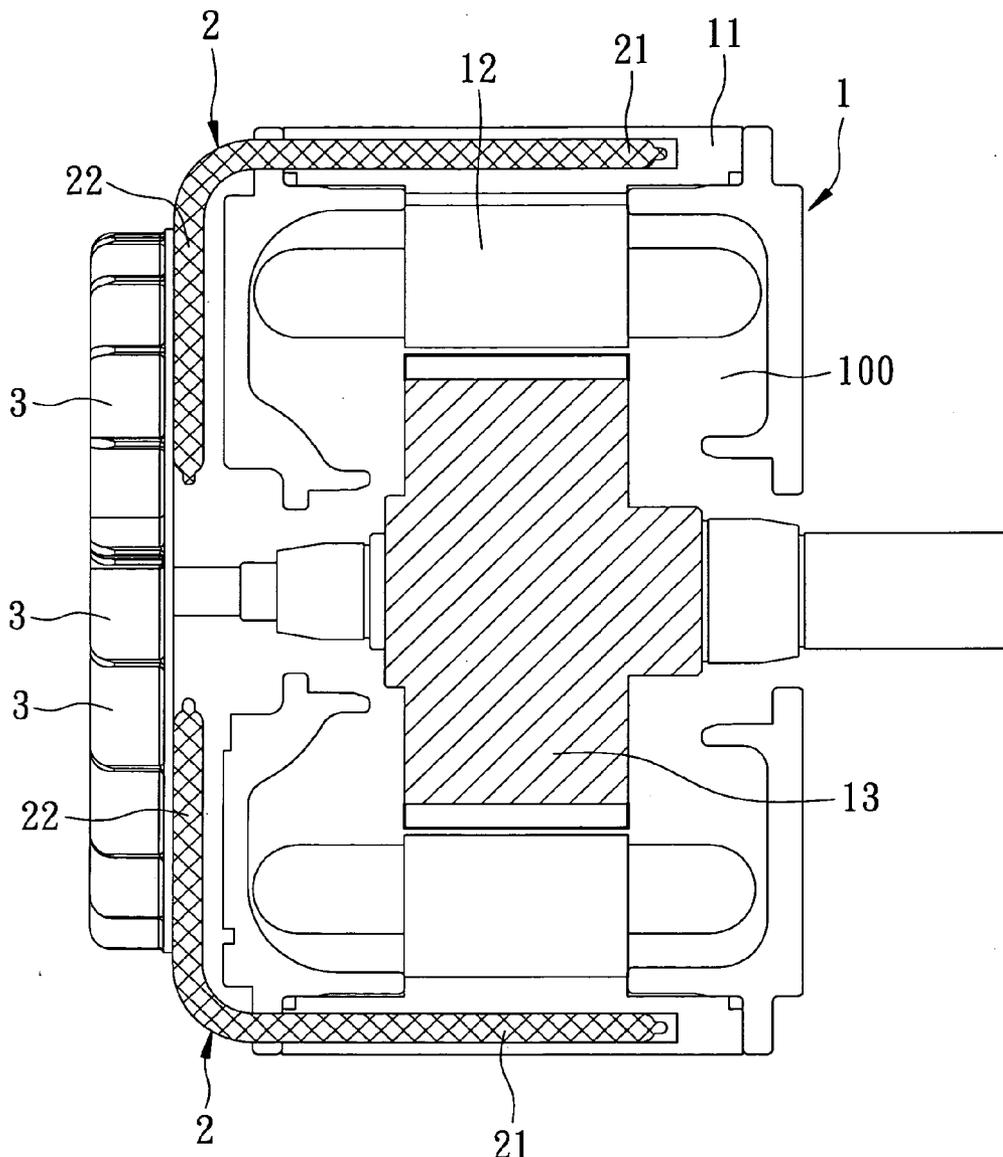
(57) **ABSTRACT**

A motor device includes a motor body and a set of heat-conducting pipes. The motor body includes a motor casing that defines a chamber, a stator that is disposed in the chamber, and a rotor that is rotatably disposed in the chamber. Each of the heat-conducting pipes has a heat-absorbing end that extends into the motor body, and a heat-dissipating end that is opposite to the heat-absorbing end and that extends outwardly of the motor body.

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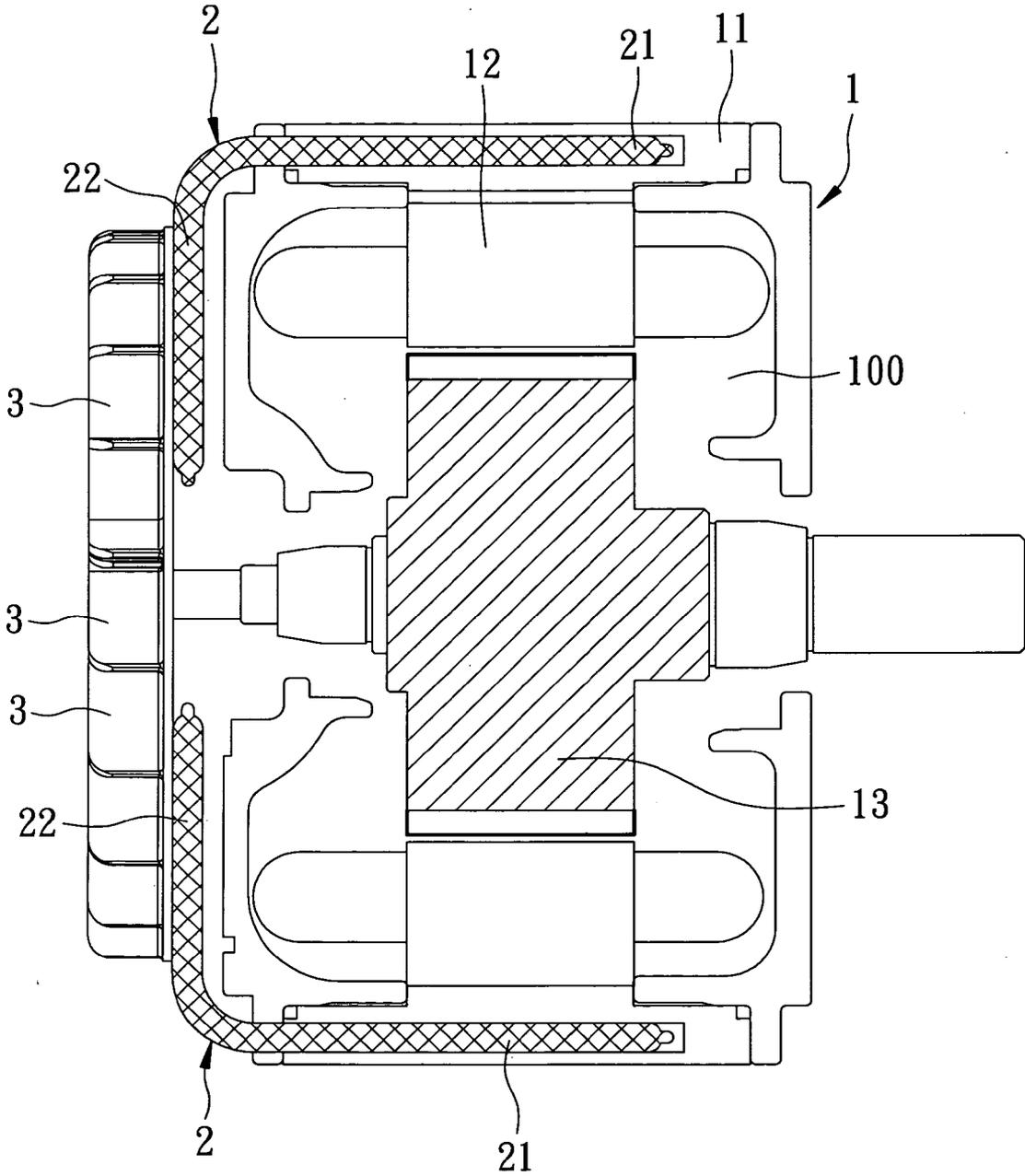


FIG. 1

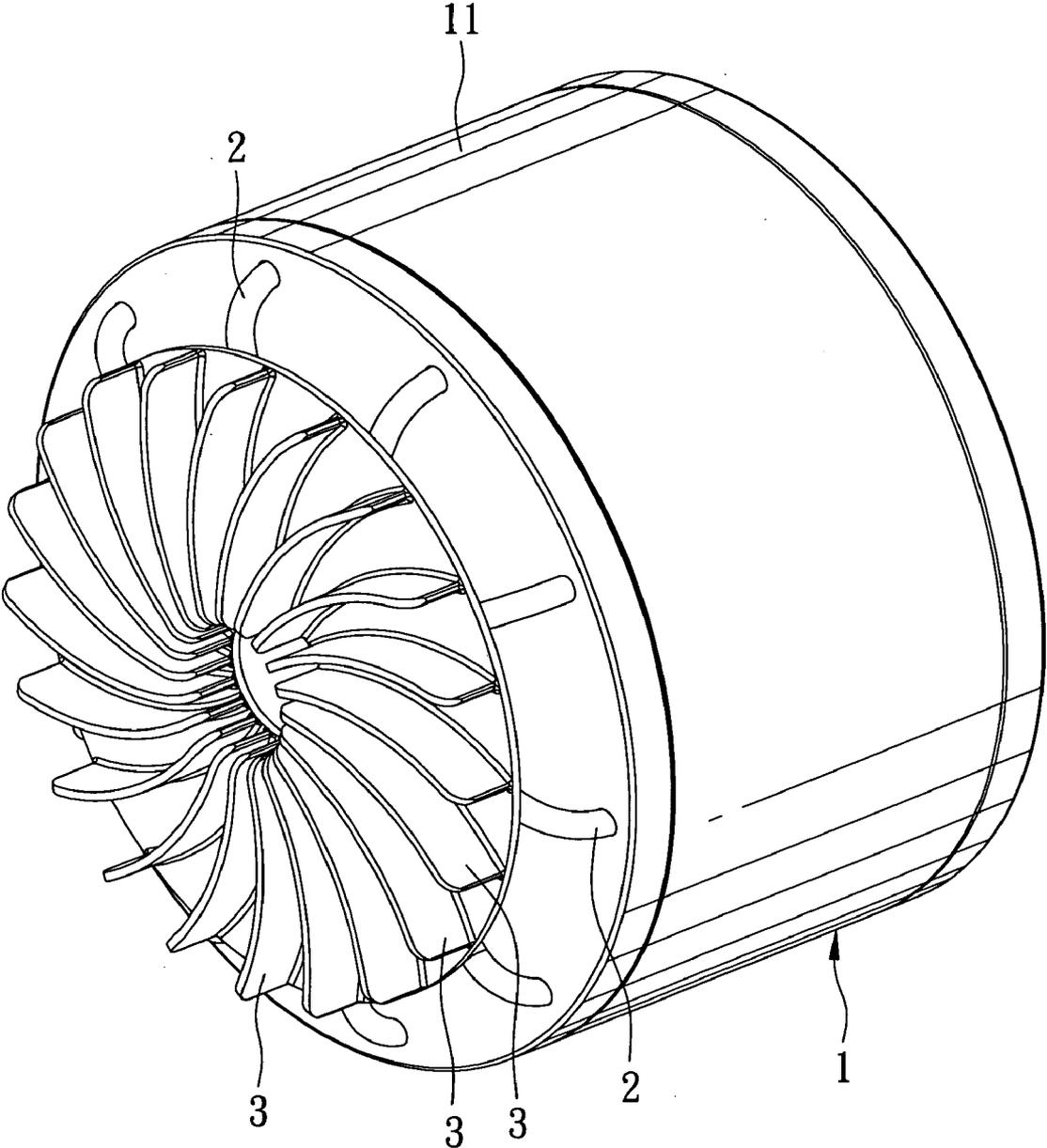


FIG. 2

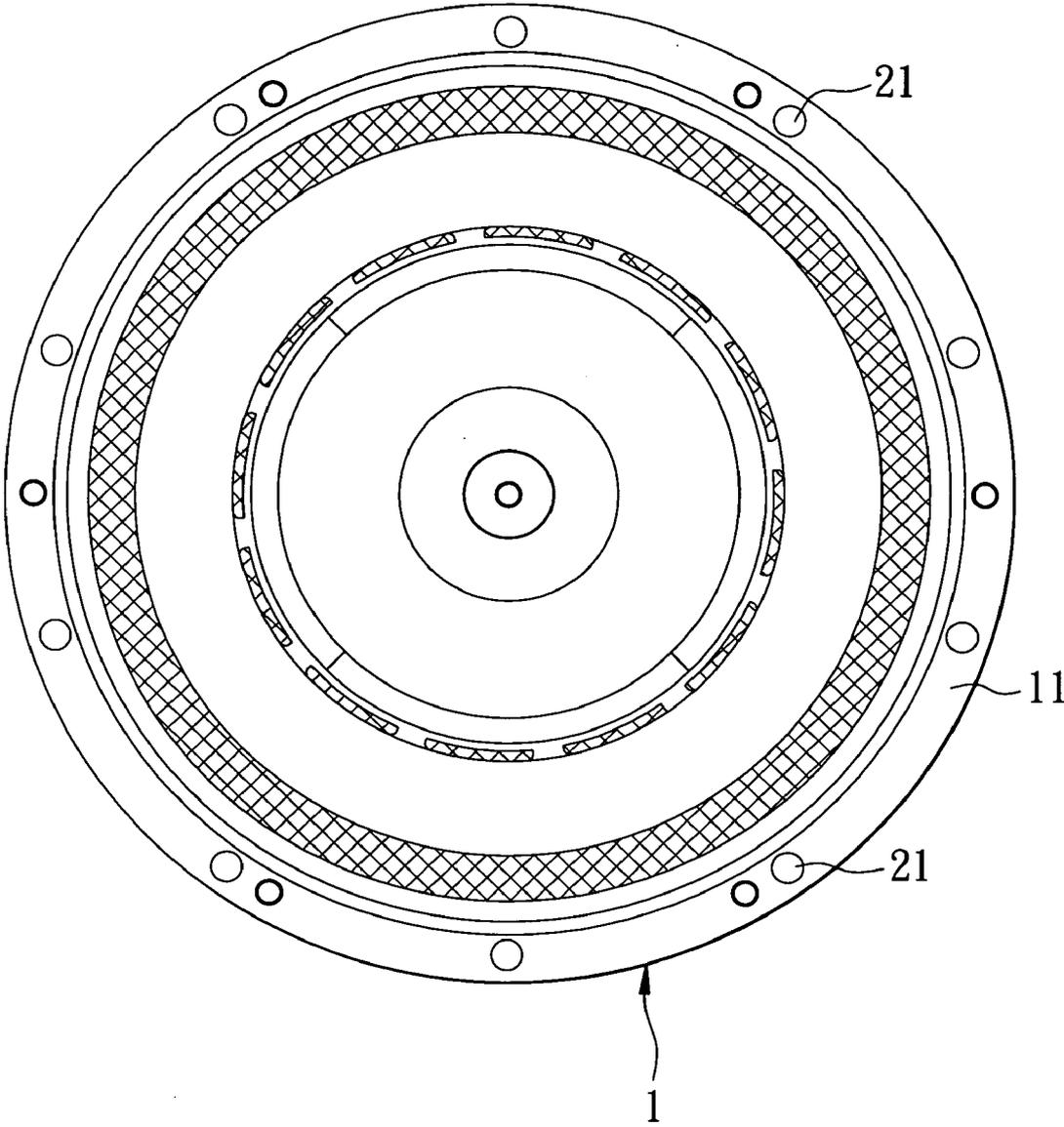


FIG. 3

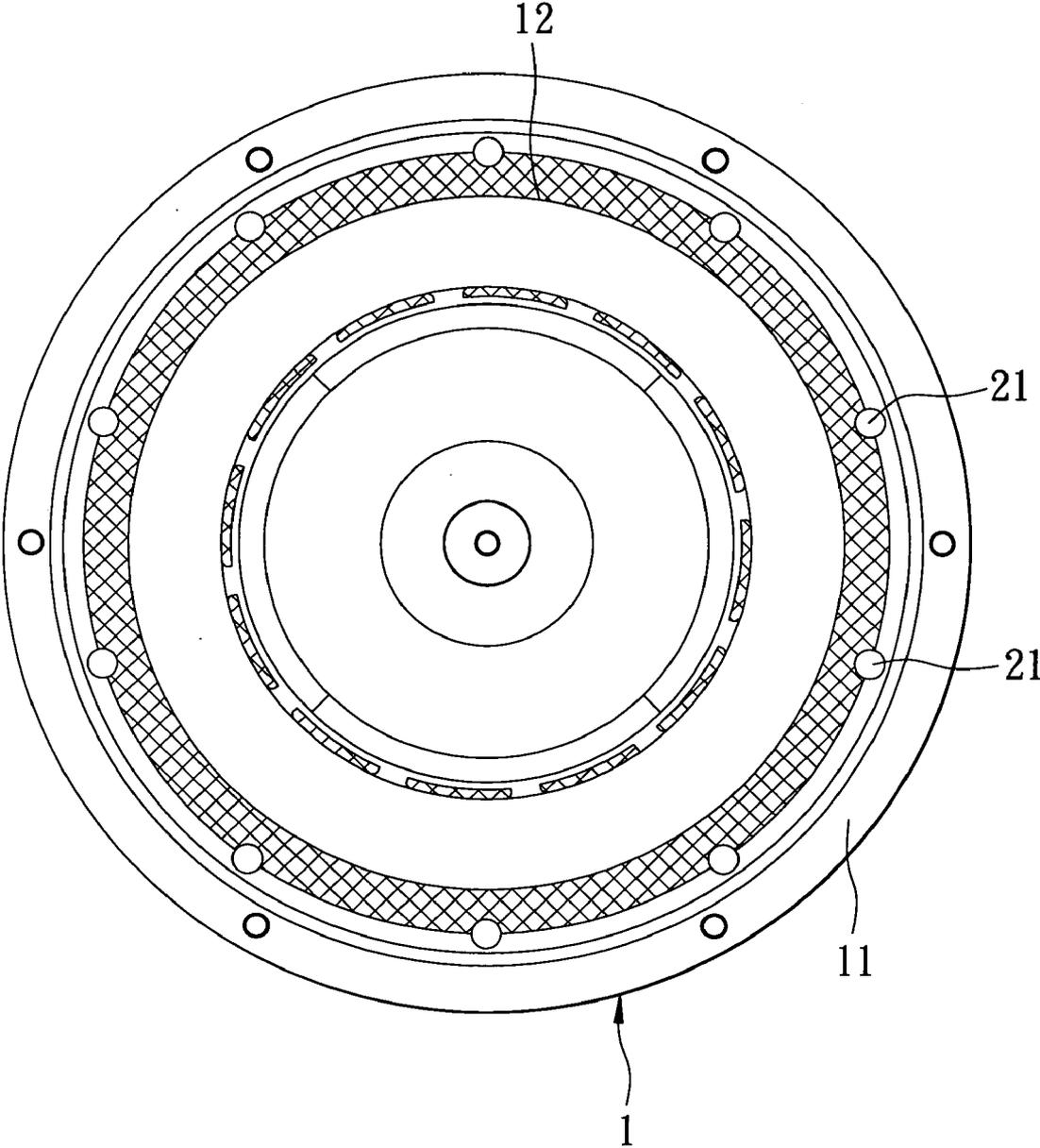


FIG. 4

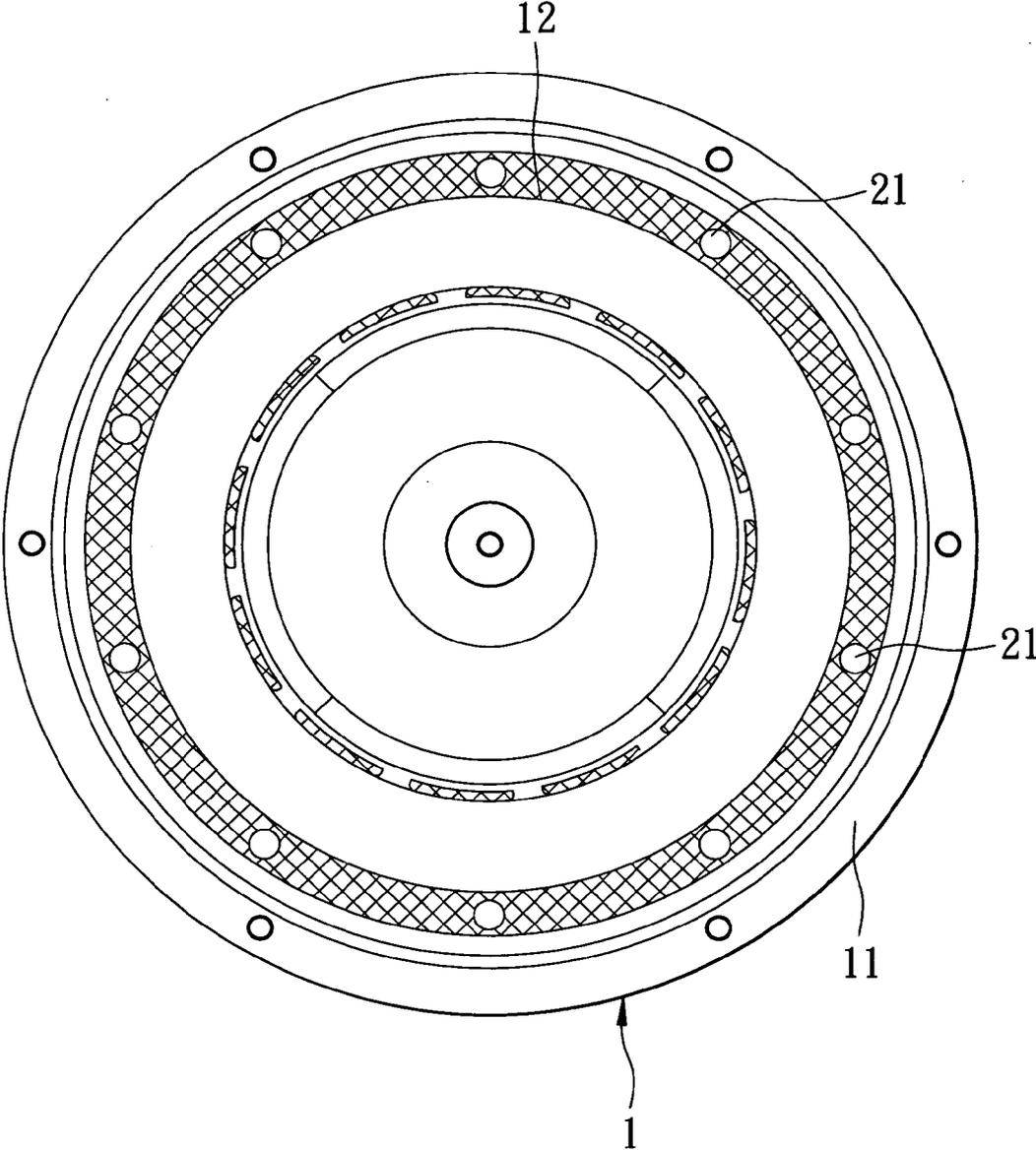


FIG. 5

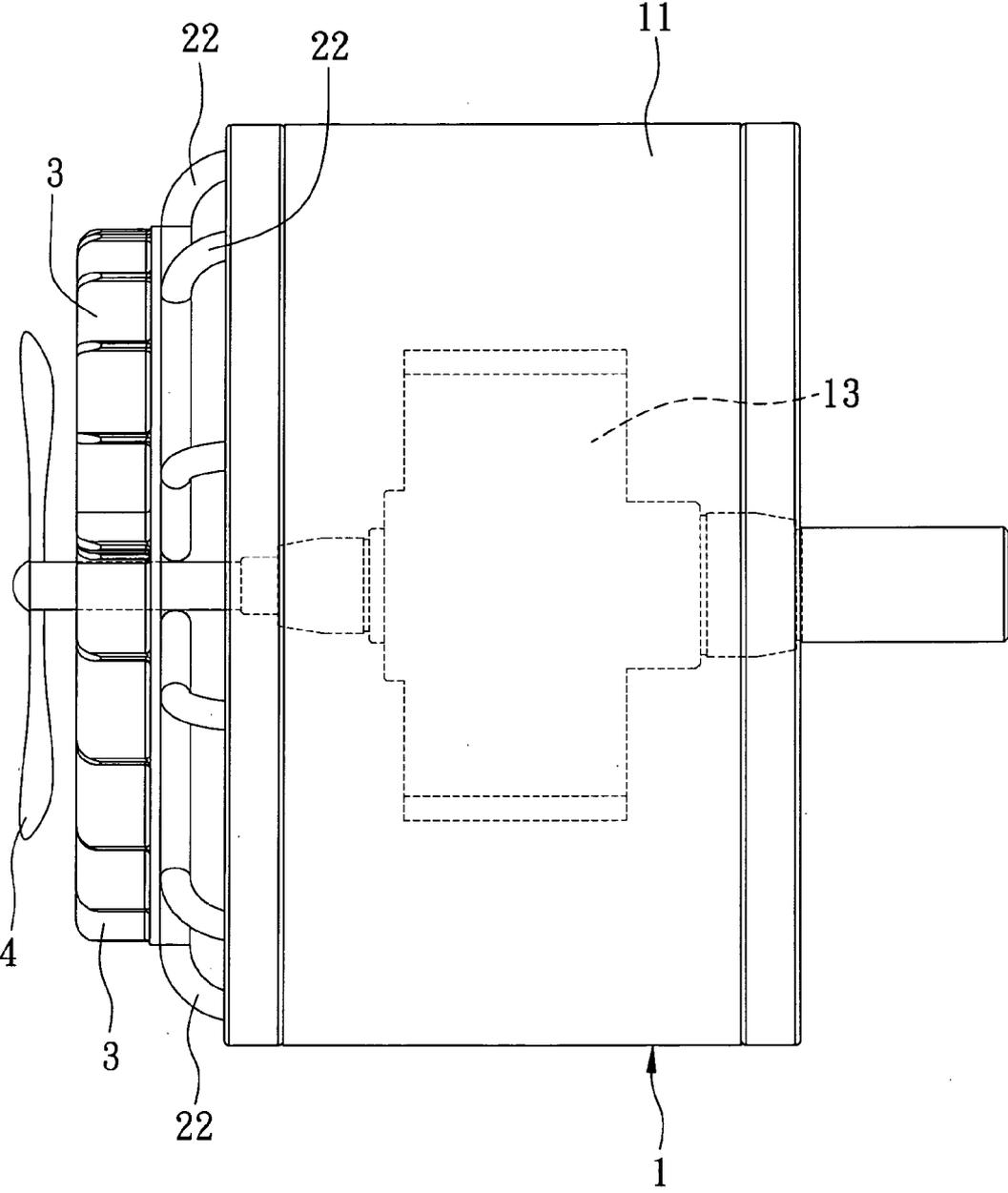


FIG. 6

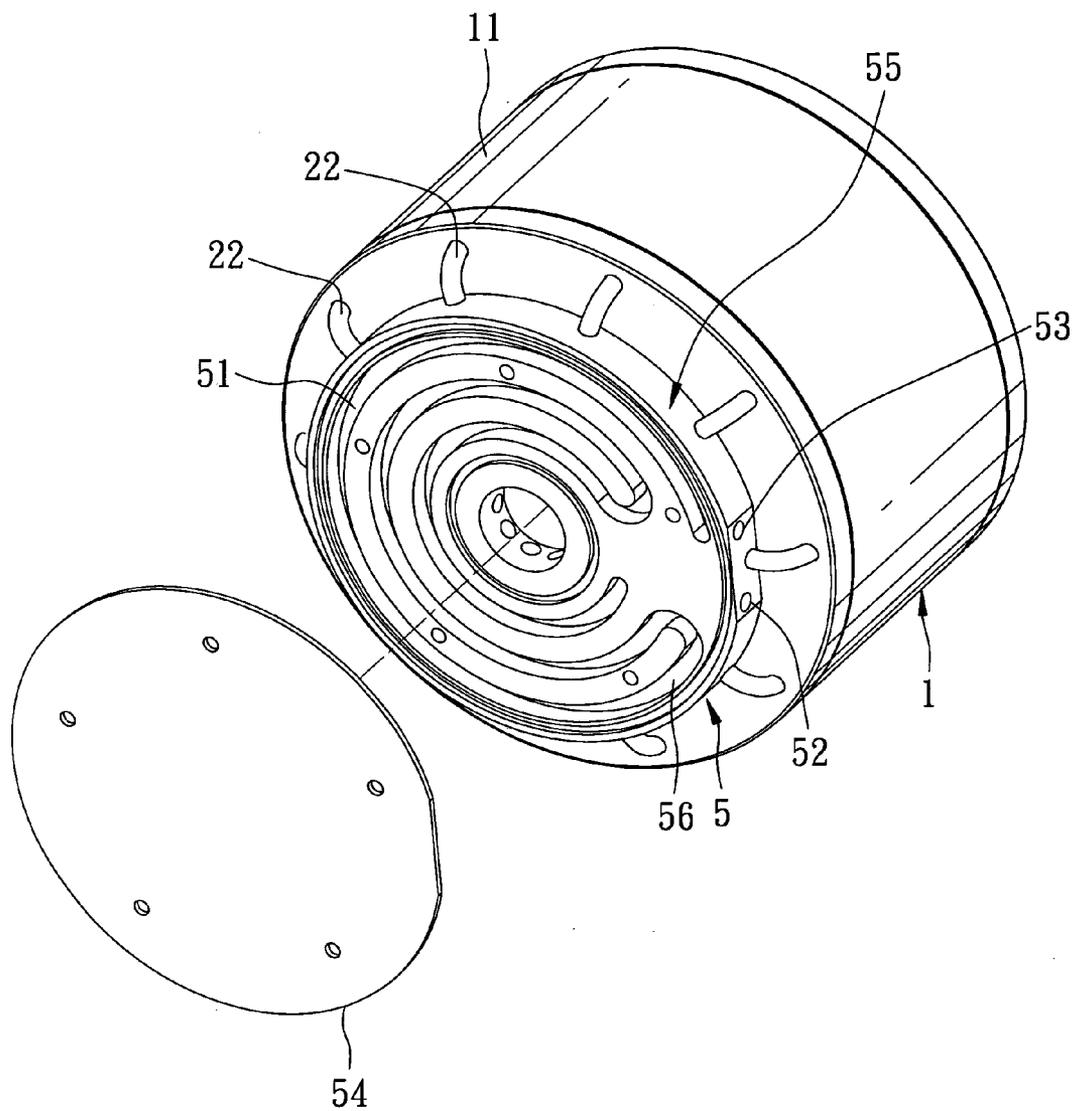


FIG. 7

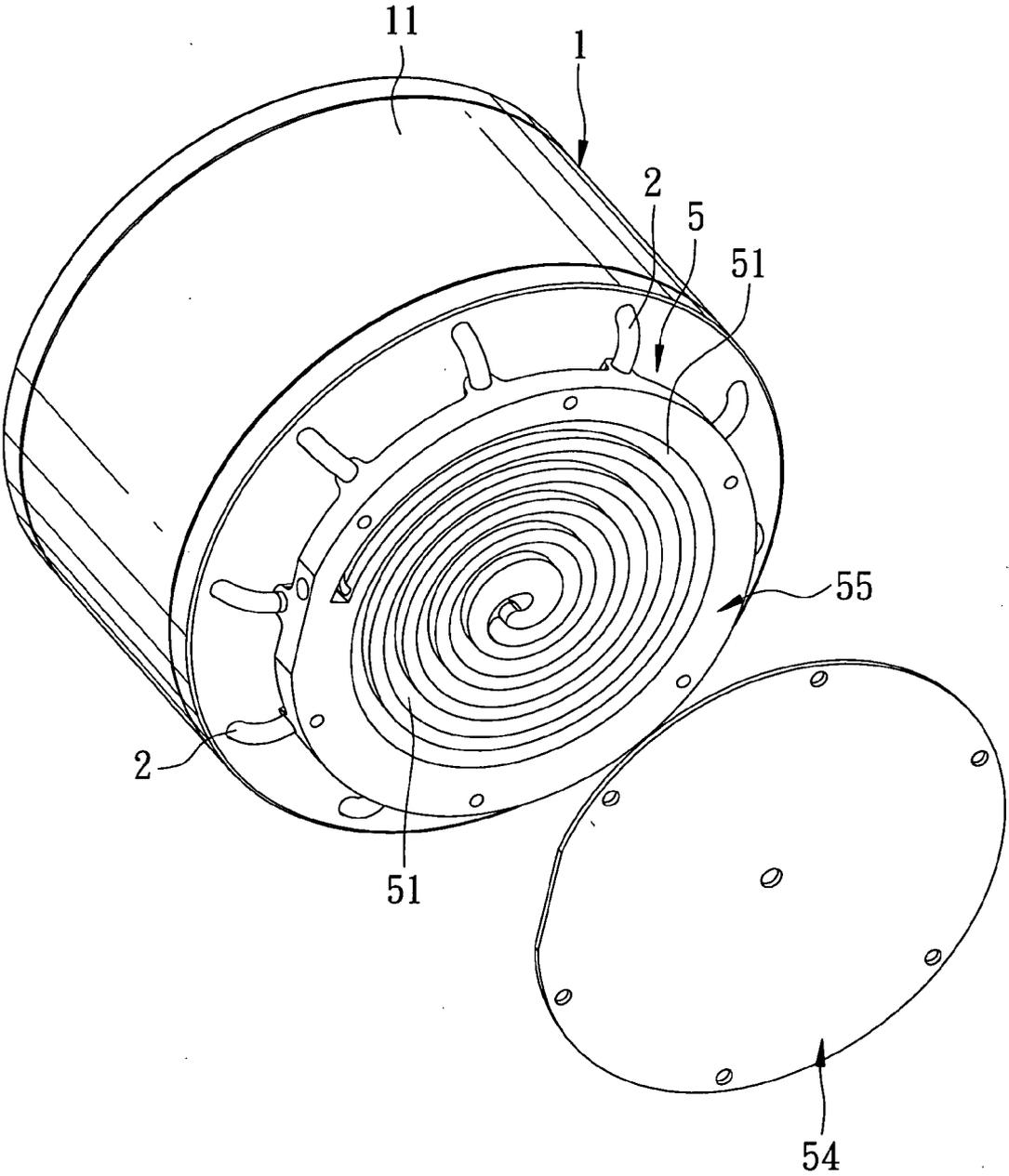


FIG. 8

MOTOR DEVICE WITH HEAT DISSIPATING CAPABILITY

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention relates to a motor device, more particularly to a motor device capable of dissipating heat in an efficient manner.

[0003] 2. Description of the Related Art

[0004] A conventional motor device has a motor casing that defines a chamber, a stator, and a rotor. The stator is fixedly disposed in the chamber, and the rotor is rotatably disposed in the chamber.

[0005] However, the conventional motor device suffers overheating, which can be detrimental to proper functioning of the motor device. Therefore, there is a need for a novel construction of a motor device that can facilitate efficient heat-dissipation.

SUMMARY OF THE INVENTION

[0006] The object of the present invention is to provide a motor device that can overcome the above drawback of the prior art.

[0007] According to the present invention, a motor device includes a motor body and a set of heat-conducting pipes. The motor body includes a motor casing that defines a chamber, a stator that is disposed in the chamber, and a rotor that is rotatably disposed in the chamber. Each of the heat-conducting pipes has a heat-absorbing end that extends into the motor body, and a heat-dissipating end that is opposite to the heat-absorbing end and that extends outwardly of the motor body.

BRIEF DESCRIPTION OF THE DRAWINGS

[0008] Other features and advantages of the present invention will become apparent in the following detailed description of the preferred embodiments with reference to the accompanying drawings, of which:

[0009] FIG. 1 is a schematic sectional view of the first preferred embodiment of a motor device according to the present invention;

[0010] FIG. 2 is a perspective view of the motor device shown in FIG. 1;

[0011] FIG. 3 is a schematic sectional view of the first preferred embodiment to illustrate a set of heat-conducting pipes extending into a motor casing of a motor body;

[0012] FIG. 4 is a schematic sectional view of the first preferred embodiment to illustrate the heat-conducting pipes extending between a stator of the motor body and the motor casing;

[0013] FIG. 5 is a schematic sectional view of the first preferred embodiment to illustrate the heat-conducting pipes extending into the stator of the motor body;

[0014] FIG. 6 is a schematic side view of the second preferred embodiment of the motor device of this invention, illustrating a fan unit disposed on the motor casing;

[0015] FIG. 7 is a partly exploded perspective view of the third preferred embodiment of the motor device of this invention, illustrating a coolant unit disposed on the motor casing; and

[0016] FIG. 8 is a partly exploded perspective view of the fourth preferred embodiment of the motor device according to the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] Referring to FIGS. 1 to 5, the first preferred embodiment of a motor device according to the present invention includes a motor body 1, a set of heat-conducting pipes 2, and a plurality of heat-dissipating fins 3. The motor body 1 includes a motor casing 11 that defines a chamber 100, a stator 12 that is disposed in the chamber 100, and a rotor 13 that is rotatably disposed in the chamber 100. Each of the heat-conducting pipes 2 has a heat-absorbing end 21 that extends into the motor body 1, and a heat-dissipating end 22 that is opposite to the heat-absorbing end 21 and that extends outwardly of the motor body 1. The heat-dissipating fins 3 are disposed on a surface of the motor casing 11. The heat-dissipating ends 22 of the heat-conducting pipes 2 extend between the surface of the motor casing 11 and the heat-dissipating fins 3. In this embodiment, as shown in FIG. 3, the heat-absorbing ends 21 of the heat-conducting pipes 2 extend into the motor casing 11, i.e., embedded in a casing wall of the motor casing 11. As such, heat-dissipating efficiency of the motor device is greatly enhanced over the conventional motor device.

[0018] In other embodiments, the heat-absorbing ends 21 of the heat-conducting pipes 2 extend between the stator 12 and the motor casing 11, as illustrated in FIG. 4. In further embodiments, the heat-absorbing ends 21 of the heat-conducting pipes 2 extend into the stator 12, as illustrated in FIG. 5.

[0019] FIG. 6 illustrates the second preferred embodiment of the present invention. The second preferred embodiment differs from the first preferred embodiment in that the motor device further includes a fan unit 4 disposed on a surface of the motor casing 11. The heat-dissipating ends 22 of the heat-conducting pipes 2 extend between the surface of the motor casing 11 and the fan unit 4. The fan unit 4 is coupled co-rotatably to the rotor 13 so as to be driven rotatably thereby.

[0020] FIG. 7 illustrates the third preferred embodiment of the present invention. The third preferred embodiment differs from the first preferred embodiment in that the motor device includes a cooling unit 5 disposed on a surface of the motor casing 11. The cooling unit 5 includes a base part 55 and a cover part 54. The base part 55 has one side formed with a meandering groove 56 that serves as a coolant channel 51. The heat-dissipating ends 22 of the heat-conducting pipes 2 extend into the cooling unit 5. The base part 55 of the cooling unit 5 is also formed with a coolant inlet 52 and a coolant outlet 53 that are in fluid communication with the coolant channel 51. The cover part 54 covers removably the one side of the base part 55. In use, the heat-dissipating pipes 2 exchange heat with the coolant circulating in the coolant channel 51 so that the heat of the motor device can be efficiently dissipated.

[0021] FIG. 8 illustrates the fourth preferred embodiment of the present invention. In this embodiment, the coolant channel 51 is spiral.

[0022] While the present invention has been described in connection with what are considered the most practical and preferred embodiments, it is understood that this invention is not limited to the disclosed embodiments but is intended to

cover various arrangements included within the spirit and scope of the broadest interpretation so as to encompass all such modifications and equivalent arrangements.

What is claimed is:

1. A motor device comprising:

a motor body including a motor casing that defines a chamber, a stator that is disposed in said chamber, and a rotor that is rotatably disposed in said chamber; and

a set of heat-conducting pipes, each having a heat-absorbing end that extends into said motor body, and a heat-dissipating end that is opposite to said heat-absorbing end and that extends outwardly of said motor body.

2. The motor device as claimed in claim 1, further comprising a plurality of heat-dissipating fins disposed on a surface of said motor casing, said heat-dissipating ends of said heat-conducting pipes extending between said surface of said motor casing and said heat-dissipating fins.

3. The motor device as claimed in claim 1, further comprising a fan unit disposed on a surface of said motor casing, said heat-dissipating ends of said heat-conducting pipes extending between said surface of said motor casing and said fan unit.

4. The motor device as claimed in claim 3, wherein said fan unit is coupled co-rotatably to said rotor.

5. The motor device as claimed in claim 1, further comprising a cooling unit disposed on a surface of said motor

casing, said cooling unit being formed with a coolant channel, and a coolant inlet and a coolant outlet that are in fluid communication with said coolant channel, said heat-dissipating ends of said heat-conducting pipes extending into said cooling unit.

6. The motor device as claimed in claim 5, wherein said cooling unit includes:

a base part having one side formed with a groove that serves as said coolant channel, said base part being formed with said coolant inlet and said coolant outlet, said heat-dissipating ends of said heat-conducting pipes extending into said base part; and

a cover part that covers removably said one side of said base part.

7. The motor device as claimed in claim 5, wherein said coolant channel is spiral.

8. The motor device as claimed in claim 1, wherein said heat-absorbing ends of said heat-conducting pipes extend into said motor casing.

9. The motor device as claimed in claim 1, wherein said heat-absorbing ends of said heat-conducting pipes extend between said stator and said motor casing.

10. The motor device as claimed in claim 1, wherein said heat-absorbing ends of said heat-conducting pipes extend into said stator.

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