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(54) **SCREW COMPRESSOR**

(57) Provided is a screw compressor (100), comprising: a housing (101), a fluid channel (140), and a silencing structure (320, 520, 620). The housing (101) is provided with a compression cavity (105); the fluid channel (140) is located in the housing (101), a first end (311) of the fluid channel (140) is communicated with the outside of the compressor (100), and a second end (312) of the fluid channel (140) is communicated with the compression cavity (105); the silencing structure (320, 520, 620) is arranged on the outer side of the fluid channel (140), the

silencing structure (320, 520, 620) comprises at least one cavity (308, 408, 508, 608, 708, 808, 908, 1008, 1108, 1208), and the at least one cavity (308, 408, 508, 608, 708, 808, 908, 1008, 1108, 1208) is communicated with the fluid channel (140). The silencing structure (320, 520, 620) is arranged at the fluid channel (140) of the screw compressor (100), so that the effect of pressure changes on external pipelines connected to the fluid channel (140) can be reduced.

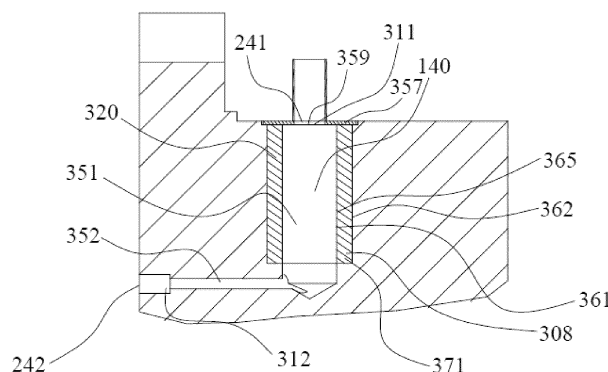


FIG. 3

Description

Technical Field

[0001] The present application provides a screw compressor, especially a screw compressor with a silencing structure.

Background Art

[0002] A twin-screw compressor has a pair of male and female rotors that can be meshed with each other, and a refrigerant is compressed by opposite rotation of the pair of male and female rotors. The twin-screw compressor is communicated with an economizer system, and the economizer system provides a part of the refrigerant (or other media) to the inside of the compressor to improve the capacity of the twin-screw compressor. The economizer system is communicated with a compression cavity of the compressor through a pipeline.

Summary of the Invention

[0003] The present application provides a screw compressor, comprising: a housing, a fluid channel, and a silencing structure. The housing is provided with a compression cavity; the fluid channel is located in the housing, a first end of the fluid channel is communicated with the outside of the compressor, and a second end of the fluid channel is communicated with the compression cavity; the silencing structure is arranged on an outer side of the fluid channel, the silencing structure comprises at least one cavity, and the at least one cavity is communicated with the fluid channel.

[0004] In the screw compressor as described above, the at least one cavity is arranged in an annular shape surrounding the fluid channel.

[0005] In the screw compressor as described above, the at least one cavity is arranged around a portion of the fluid channel.

[0006] In the screw compressor as described above, the at least one cavity comprises a plurality of chambers, and the plurality of chambers are arranged in an extension direction of the fluid channel.

[0007] In the screw compressor as described above, the at least one cavity comprises a plurality of chambers, and the plurality of chambers are arranged alternately in the extension direction of the fluid channel.

[0008] In the screw compressor as described above, the silencing structure further comprises a silencing material, and the silencing material is filled in the at least one cavity.

[0009] In the screw compressor as described above, the silencing material comprises a plurality of acoustic meta-silencing units, and at least a portion of the plurality of acoustic meta-silencing units are communicated with the fluid channel.

[0010] In the screw compressor as described above,

the silencing structure further comprises a side wall, the side wall is arranged around the fluid channel and is located between the fluid channel and the at least one cavity, the side wall is provided with a plurality of side wall channels, and the side wall channels penetrate through the side wall to communicate the at least one cavity with the fluid channel.

[0011] In the screw compressor as described above, in an extending direction of the fluid channel, the at least one cavity has a front end and a rear end, the front end is close to the first end of the fluid channel, and the rear end is far away from the first end of the fluid channel; at least one side wall channel of the plurality of side wall channels is close to the rear end of the at least one cavity.

[0012] In the screw compressor as described above, the silencing structure is close to the first end of the fluid channel, and the first end of the fluid channel is communicated with an economizer of an air conditioning system.

[0013] The screw compressor in the present application is internally provided with the fluid channel that can communicate the compression cavity with an external economizer system. The fluid channel can introduce a refrigerant in the economizer into the compression cavity. Since teeth of rotors periodically sweep through an outlet of the fluid channel during operation of the screw compressor, pressures in tooth slots on two sides of the teeth of the rotors are different, resulting in constant pressure changes of fluid in the fluid channel, which may cause joint loosening or breaking of a pipeline connected to the economizer system due to vibration. The silencing structure is arranged at the fluid channel in the present application, so that an effect of pressure changes on an external pipeline of the economizer system can be reduced.

Brief Description of the Drawings

[0014]

FIG. 1A is a perspective view of a compressor in the present application;

FIG. 1B is a cross-sectional view of the compressor in FIG. 1A;

FIG. 2 is a perspective view of a rear housing in a first embodiment of the present application;

FIG. 3 is a partial cross-sectional view of FIG. 2;

FIG. 4 is a partial cross-sectional view of a rear housing in a second embodiment of the present application;

FIG. 5A is a perspective view of a silencing structure in a third embodiment of the present application;

FIG. 5B is a bottom view of the silencing structure in FIG. 5A viewed in an axial direction;

FIG. 5C is an axial cross-sectional view of the silencing structure sectioned along a B-B line in FIG. 5B;

FIG. 5D is an axial cross-sectional view of the silencing structure sectioned along a C-C line in FIG. 5B;

FIG. 6 is an axial cross-sectional view of a silencing

structure in a fourth embodiment of the present application;

FIG. 7 is an axial cross-sectional view of a silencing structure in a fifth embodiment of the present application;

FIG. 8 is a radial cross-sectional view of a silencing structure in a sixth embodiment of the present application;

FIG. 9 is a partial cross-sectional view of a rear housing in a seventh embodiment of the present application;

FIG. 10 is a partial cross-sectional view of a rear housing in an eighth embodiment of the present application;

FIG. 11 is a partial cross-sectional view of a rear housing in a ninth embodiment of the present application;

FIG. 12 is a partial cross-sectional view of a rear housing in a tenth embodiment of the present application.

Detailed Description of Embodiments

[0015] Various specific embodiments of the present application will be described below with reference to the drawings that constitute a part of the specification. It should be understood that although terms used to indicate direction in the present application, such as "front", "rear", "upper", "lower", "left", "right", etc., are used to describe various exemplary structural portions and elements of the present application, these terms are used herein solely for the purpose of convenient explanation, which are determined based on exemplary orientations shown in the drawings. Since the embodiments disclosed in the present application can be arranged in different directions, these terms indicating directions are used only for illustration and should not be regarded as limitations.

[0016] FIG. 1A is a perspective view of a compressor in the present application. FIG. 1B is a cross-sectional view of the compressor in FIG. 1A. The compressor 100 comprises a housing 101 and a male rotor 102 and a female rotor 103 that are located in the housing 101. The male rotor 102 and the female rotor 103 can be driven to rotate. The male rotor 102 is in transmission connection with a motor 160, so that the motor 160 can drive the male rotor 102 to rotate around an axis of the male rotor 102 relative to the housing 101. The female rotor 103 can be driven by the male rotor 102 to rotate around an axis of the female rotor 103 relative to the housing 101. An outer side of the male rotor 102 has a plurality of spiral teeth 168 and spiral grooves formed between the adjacent teeth 168, and an outer side of the female rotor 103 also has a plurality of spiral teeth 169 and spiral grooves formed between the adjacent teeth 169. The teeth 168 and grooves of the male rotor 102 and the grooves and teeth 169 of the female rotor 103 form an intermeshing structure, so that the male rotor 102, the female rotor 103 and

the housing 101 together form a compression cavity 105. A fluid channel 140 is arranged in the housing 101 and is used for providing a refrigerant into the compression cavity 105 of the compressor 100.

[0017] The housing 101 comprises a front housing 171, a middle housing 172, and a rear housing 173. The front housing 171, the middle housing 172 and the rear housing 173 are connected in sequence. Fluid flows from the front housing 171 to the rear housing 173 in the compressor. The fluid channel 140 is located on the rear housing 173. An outlet of the fluid channel 140 is communicated with the compression cavity 105, an inlet of the fluid channel is connected to an economizer system through a pipeline, and the economizer system introduces a part of the refrigerant in a refrigeration cycle system back to the compressor to improve the capacity of the compressor. For example, the economizer system communicates the fluid channel 140 with a bottom of a condenser or a subcooler and introduces a small part of the refrigerant liquid from the bottom of the condenser or the subcooler back to the compressor, and this part of the refrigerant liquid can enter the compressor using a natural pressure difference. In the screw compressor, the teeth of the male rotor 102 or the female rotor 103 periodically pass through the outlet of the fluid channel 140. Since pressures in tooth slots on two sides of the teeth of the rotors are obviously different, the pressure at the outlet of the fluid channel 140 is changed to a certain extent. Complex flow regime and pressure pulsations present in the fluid channel 140 may lead to the risk of joint loosening or breaking of a pipeline connected to the economizer system due to vibration. A silencing structure is arranged at the fluid channel 140 in the present application, which can reduce the amplitude of the pressure pulsations, thereby reducing an effect of the pressure pulsations on an external pipeline.

[0018] FIG. 2 is a perspective view of a rear housing in a first embodiment of the present application. As shown in FIG. 2, the rear housing 173 has a housing end surface 202 that is arranged toward the middle housing 172, exhaust ends of the male rotor 102 and the female rotor 103 abut against the housing end surface 202, and the housing end surface 202 can close a terminal end of the compression cavity 105. The housing end surface 202 is further provided with an internal exhaust orifice 235, and the compression cavity 105 can be aligned with the internal exhaust orifice 235. During rotation of the male rotor 102 and the female rotor 103, gas in the compression cavity 105 is continuously compressed until the compression cavity 105 is communicated with the internal exhaust orifice 235, and the gas in the compression cavity 105 enters an exhaust cavity of the compressor through the internal exhaust orifice 235 and is then discharged out of the compressor. The fluid channel 140 has an inlet 241 and an outlet 242. The outlet 242 is arranged on the housing end surface 202 and can be swept by the exhaust end of the male rotor 102 or the female rotor 103 so as to be communicated with the compression cavity

105. The inlet 241 is arranged on an outer surface of the rear housing 173, the inlet 241 is communicated with an external pipeline 250, and the external pipeline 250 is used to connect an economizer system, so that the economizer system can supply a refrigerant into the compression cavity 105 through the fluid channel 140.

[0019] FIG. 3 is a partial cross-sectional view of FIG. 2, and FIG. 3 is a partial view of the rear housing 173 in FIG. 2 that is sectioned in a direction shown as A-A and viewed in a direction shown as an arrow, showing a structure adjacent to the fluid channel 140 in the rear housing 173. The fluid channel 140 comprises a first end 311 and a second end 312, the inlet 241 is located at the first end 311, and the outlet 242 is located at the second end 312. An area of the inlet 241 is equal to or smaller than a cross-sectional area of the fluid channel 140. In one embodiment of the present application, the fluid channel 140 comprises a front section 351 and a rear section 352, the front section 351 extends in a vertical direction, and the rear section 352 extends in a horizontal direction as shown in FIG. 3. In the present application, the front section 351 and the rear section 352 are arranged under the premise of convenient machining to adapt to opposite positions of the inlet 241 and the outlet 242 so as to communicate the compression cavity 105 with the external pipeline. When the arrangement of the position of the inlet 241 is changed, the arrangement of the position and the arrangement of an extension direction of the front section 351 and the rear section 352 of the fluid channel 140 are changed accordingly.

[0020] In one embodiment of the present application, the first end 311 comprises a top plate 357 with a hole 359 in a middle portion, and the top plate 357 covers an end portion of the first end 311. The hole 359 of the top plate 357 forms the inlet 241.

[0021] In another embodiment of the present application, the inlet 241 is arranged at another position of the rear housing 173, and the fluid channel 140 extends in a same direction.

[0022] As shown in FIG. 3, an outer side of the front section 351 of the fluid channel 140 is provided with a silencing structure 320 around the front section 351. The silencing structure 320 comprises a cavity 308 and a silencing material 371 located in the cavity 308. The cavity 308 is communicated with the front section 351. The cavity 308 has an inner side 361 and an outer side 362. The inner side 361 and the outer side 362 have a certain distance, so that the cavity 308 has a certain thickness in a radial direction of the fluid channel. The cavity 308 is generally in an annular shape with a certain thickness. In one embodiment of the present application, the outer side 362 has a side wall formed by the rear housing 173, the inner side 361 has an opening 365, and the opening 365 is communicated with the front section 351 of the fluid channel 140. In one embodiment of the present application, a height of the opening 365 is equal to that of the cavity 308, and the opening 365 extends for a circle in a circumferential direction to form a closed

annular shape. That is, an area of the opening 365 is equal to an outer surface area of the front section surrounded by the silencing structure. That is to say, the cavity 308 and the front section 351 of the fluid channel 140 can form an integral space. In another embodiment of the present application, the area of the opening 365 is smaller than the outer surface area of the front section 351 surrounded by the cavity 308. For example, the height of the opening 365 is smaller than that of the cavity 308, or the opening 365 extends for less than a circle in a circumferential direction.

[0023] The silencing material 371 is an acoustic material composed of a plurality of acoustic meta-silencing units. The acoustic meta-silencing units are resonant cavity type acoustic meta-silencing units. Each of the acoustic meta-silencing units has a cavity, and the cavities of the acoustic meta-silencing units can be communicated with the front section 351 of the fluid channel 140. The silencing material 371 can absorb the pressure pulsations in the fluid channel 140 to a certain extent to reduce an effect of the pressure pulsations on the external pipeline.

[0024] The silencing units in the silencing material 371 are arranged at a single size or multiple sizes, so that the silencing units can be arranged to silence a sound of a certain hertz (i.e., a certain frequency), or can be used to silence sounds of multiple hertz.

[0025] In the present embodiment, the silencing structure 320 is arranged close to the inlet 241 of the fluid channel 140, that is, close to a junction between the fluid channel 140 and the external pipeline, to reduce an effect of the pressure pulsations on the external pipeline as much as possible. In another embodiment of the present application, the silencing structure 320 may also be arranged around the entire fluid channel 140, that is, the silencing structure 320 is arranged on an outer side of each section of the fluid channel 140.

[0026] It should be noted that in the present embodiment, even when the silencing material 371 is not arranged in the cavity 308, the hollow cavity 308 can absorb the pressure pulsations in the fluid channel 140 to a certain extent.

[0027] FIG. 4 is a partial cross-sectional view of a rear housing in a second embodiment of the present application. Similar to the embodiment shown in FIG. 3, differences are that a plurality of cavities 408 are arranged in an extension direction of the fluid channel 140, and each of the cavities 408 has a distance from the adjacent cavities 408. Each of the cavities 408 is provided with the silencing material 371, or is an empty cavity. That is to say, the cavities can be intermittently arranged in the extension direction of the fluid channel 140. Compared with the first embodiment in FIG. 3, the second embodiment in FIG. 4 has similar technical effects.

[0028] FIG. 5A is a perspective view of a silencing structure in a third embodiment of the present application; FIG. 5B is a bottom view of the silencing structure in FIG. 5A viewed in an axial direction; FIG. 5C is an axial

cross-sectional view of the silencing structure sectioned along a B-B line in FIG. 5B; and FIG. 5D is an axial cross-sectional view of the silencing structure sectioned along a C-C line in FIG. 5B. Wherein, a cross-section in FIG. 5B is shown in FIG. 5A and FIG. 5B. The silencing structure 520 is generally in a cylindrical shape and has an axial direction and a radial direction. The silencing structure 520 has an inner wall 511 and an outer wall 512. At least a section of the fluid channel 140 is surrounded by the inner wall 511. For example, the front section 351 of the fluid channel 140 is surrounded by the inner wall 511. The outer wall 512 is connected to the rear housing 173. A space 522 is formed between the inner wall 511 and the outer wall 512. A plurality of radial partition walls 518 extending in the radial direction and a plurality of axial partition walls 519 extending in the axial direction are arranged between the inner wall 511 and the outer wall 512. The plurality of radial partition walls 518 are arranged in a juxtaposed manner in the axial direction to divide the space 522 into a plurality of segmented spaces 521, and the plurality of axial partition walls 519 are arranged in the radial direction to divide the plurality of segmented spaces 521 into a plurality of cavities 508. The plurality of axial partition walls 519 in the adjacent segmented spaces 521 are arranged alternately, so that the plurality of cavities 508 are arranged alternately.

[0029] Wherein, the inner wall 511 forms a side wall 539 of the silencing structure, the side wall 539 is provided with a plurality of side wall channels 529 penetrating through the side wall 539, and the plurality of side wall channels 529 can communicate the fluid channel 140 with each of the plurality of cavities 508. Wherein, in the extension direction of the fluid channel 140, each of the plurality of cavities 508 has a front end 581 and a rear end 582, the front end 581 is close to the first end 311 of the fluid channel 140, and the rear end 582 is far away from the first end 311 of the fluid channel 140. At least one side wall channel of the plurality of side wall channels 529 is close to the rear ends 582 of the cavities 508 to facilitate the introduction of fluid in the cavities 508 back into the fluid channel 140, so that no liquid or a small amount of liquid is accumulated in the fluid channel 140.

[0030] Compared with the first embodiment in FIG. 3, the third embodiment in FIG. 5A has similar technical effects.

[0031] FIG. 6 is an axial cross-sectional view of a silencing structure in a fourth embodiment of the present application. Similar to the embodiment shown in FIG. 5A, differences are that the silencing structure 620 in the fourth embodiment is not provided with an outer wall, and when the silencing structure 620 is mounted on the rear housing 173, the rear housing 173, axial partition walls, an inner wall 611 and radial partition walls 618 together form a plurality of cavities 608.

[0032] Compared with the third embodiment in FIG. 5A, the fourth embodiment in FIG. 6 has similar technical effects.

[0033] FIG. 7 is an axial cross-sectional view of a

silencing structure in a fifth embodiment of the present application. Similar to the embodiment shown in FIG. 5A, the difference is that bottoms 765 of cavities 708 in the fifth embodiment extend obliquely downward from the outside to the inside. Such design is more conducive to discharging liquid in the cavities 708 to the fluid channel 140, thereby avoiding the accumulation of liquid in the cavities 708.

[0034] Compared with the third embodiment in FIG. 5A, the fifth embodiment in FIG. 7 has similar technical effects.

[0035] FIG. 8 is a radial cross-sectional view of a silencing structure in a sixth embodiment of the present application. Similar to the embodiment shown in FIG. 5A, the difference is that an inner wall 811 and an outer wall 812 in the sixth embodiment are not coaxially arranged. That is to say, as seen from a radial cross-section, the inner wall 811 and the outer wall 812 have an unequal distance. Thus, each of cavities 808 is no longer evenly distributed in a circumferential direction. The present embodiment is suitable for some situations with specific requirements for the mounting position of the fluid channel 140.

[0036] Compared with the third embodiment in FIG. 5A, the sixth embodiment in FIG. 8 has similar technical effects.

[0037] FIG. 9 is a partial cross-sectional view of a rear housing in a seventh embodiment of the present application. Similar to the embodiment shown in FIG. 3, differences are that a silencing structure in the seventh embodiment in FIG. 9 further comprises a side wall 939, the side wall 939 is generally in a cylindrical shape, and the side wall 939 surrounds at least a section of the fluid channel 140. That is to say, the side wall 939 is arranged between the fluid channel 140 and cavities 908. The side wall 939 is provided with a plurality of side wall channels 929 penetrating through the side wall 939, and the plurality of side wall channels 929 can communicate the fluid channel 140 with each of the cavities 908. In the extension direction of the fluid channel 140, the cavities 908 have front ends 981 and rear ends 982, the front ends 981 are close to the first end 311 of the fluid channel 140, and the rear ends 982 are far away from the first end 311 of the fluid channel 140. At least one side wall channel of the plurality of side wall channels 929 is close to the rear ends 982 of the cavities 908 to facilitate the introduction of fluid in the cavities 908 back into the fluid channel 140, so that no liquid or a small amount of liquid is accumulated in the fluid channel 140.

[0038] The silencing structure in the seventh embodiment in FIG. 9 further comprises a top plate 945, and the top plate 945 covers tops of the cavities 908 and the side wall 939 to isolate the cavities 908 from the outside. The top plate 945 is provided with a hole 958, and the external pipeline is communicated with the fluid channel through the hole 958. In one embodiment of the present application, the side wall 939 and the top plate 945 are of an integrated structure to facilitate installation.

[0039] Similar to the embodiment shown in FIG. 3, the cavities 908 are provided with a silencing material. Compared with the first embodiment in FIG. 3, the seventh embodiment in FIG. 9 has similar technical effects.

[0040] Figure 10 is a partial cross-sectional view of a rear housing in an eighth embodiment of the present application. Similar to the embodiment shown in FIG. 9, differences are that a plurality of cavities 1008 are arranged in the extension direction of the fluid channel 140, and each of the cavities 1008 has a distance from the adjacent cavities 1008. That is to say, the cavities can be intermittently arranged in the extension direction of the fluid channel 140. Compared with the first embodiment in FIG. 3, the eighth embodiment in FIG. 10 has similar technical effects.

[0041] FIG. 11 is a partial cross-sectional view of a rear housing in a ninth embodiment of the present application. Similar to the embodiment shown in FIG. 9, differences are that cavities 1108 are not provided with a silencing material and are empty cavities. Compared with the embodiment in FIG. 9, the ninth embodiment in FIG. 11 has similar technical effects.

[0042] FIG. 12 is a partial cross-sectional view of a rear housing in a tenth embodiment of the present application. Similar to the embodiment shown in FIG. 10, differences are that cavities 1208 are not provided with a silencing material and are empty cavities. Compared with the embodiment in FIG. 10, the ninth embodiment in FIG. 12 has similar technical effects.

[0043] The fluid channel in the present application can introduce a refrigerant in an economizer into the compression cavity. During operation of the screw compressor, the teeth of the rotors periodically sweep through the outlet of the fluid channel, that is, a communication port between the fluid channel and the compression cavity. Since pressures in tooth slots on two sides of the teeth of the screw rotors are different, the pressure of fluid in the fluid channel is constantly changed, leading to vibration and noise. Changes of the pressure are transmitted to the external pipeline that connects the economizer system with the fluid channel of the compressor, which may cause joint loosening or breaking of the external pipeline. The silencing structure is arranged on an outer side of the fluid channel in the present application, which can absorb at least a part of the pressure fluctuations, reduce noise, and reduce an effect of pressure changes on the external pipeline of the economizer system.

[0044] Although the present disclosure has been described in conjunction with examples of the embodiments as summarized above, various alternatives, modifications, variations, improvements and/or substantial equivalents, whether known, present, or foreseeable in the near future, may be apparent to those of at least ordinary skill in the art. In addition, technical effects and/or technical problems described in the specification are illustrative rather than restrictive. Thus, the disclosure in the specification may be used to solve other technical problems and/or have other technical effects. Therefore,

the examples of the embodiments of the present disclosure as described above are intended to be illustrative rather than restrictive. Various changes may be made without departing from the spirit or scope of the present disclosure. Therefore, the present disclosure is intended to comprise all known or earlier developed alternatives, modifications, variations, improvements and/or substantial equivalents.

Claims

1. A screw compressor, comprising:

a housing (101), wherein the housing (101) is provided with a compression cavity (105);
a fluid channel (140), wherein the fluid channel (140) is located in the housing, a first end (311) of the fluid channel (140) is communicated with the outside of the compressor, and a second end (312) of the fluid channel (140) is communicated with the compression cavity (105);
a silencing structure, wherein the silencing structure is arranged on an outer side of the fluid channel (140), the silencing structure comprises at least one cavity, and the at least one cavity is communicated with the fluid channel (140).

2. The screw compressor of claim 1, wherein:

the at least one cavity is arranged in an annular shape surrounding the fluid channel (140).

3. The screw compressor of claim 1, wherein:

the at least one cavity is arranged around a portion of the fluid channel (140).

4. The screw compressor of claim 1, wherein:

the at least one cavity comprises a plurality of chambers, and the plurality of chambers are arranged in an extension direction of the fluid channel (140).

5. The screw compressor of claim 4, wherein:

the at least one cavity comprises a plurality of chambers, and the plurality of chambers are arranged alternately in the extension direction of the fluid channel (140).

6. The screw compressor of claim 1, wherein:

the silencing structure further comprises a silencing material, and the silencing material is filled in the at least one cavity.

7. The screw compressor of claim 6, wherein:

the silencing material comprises a plurality of acoustic meta-silencing units, and at least a portion of the plurality of acoustic meta-silencing units are communicated with the fluid channel (140).

8. The screw compressor of claim 1, wherein:
the silencing structure further comprises a side wall
(939), the side wall (939) is arranged around the fluid chan-
nel (140) and is located between the fluid chan- 5
nel (140) and the at least one cavity, the side wall
(939) is provided with a plurality of side wall channels
(929), and the side wall channels (929) penetrate
through the side wall (939) to communicate the at
least one cavity with the fluid channel (140). 10
9. The screw compressor of claim 8, wherein:
- in an extension direction of the fluid channel
(140), the at least one cavity has a front end
(981) and a rear end (982), the front end (981) is 15
close to the first end of the fluid channel (140),
and the rear end (982) is far away from the first
end of the fluid channel (140);
at least one side wall channel of the plurality of
side wall channels (929) is close to the rear end 20
(982) of the at least one cavity.
10. The screw compressor of claim 1, wherein:
the silencing structure is close to the first end (311) of
the fluid channel (140), and the first end (311) of the 25
fluid channel (140) is communicated with an econ-
omizer of an air conditioning system.

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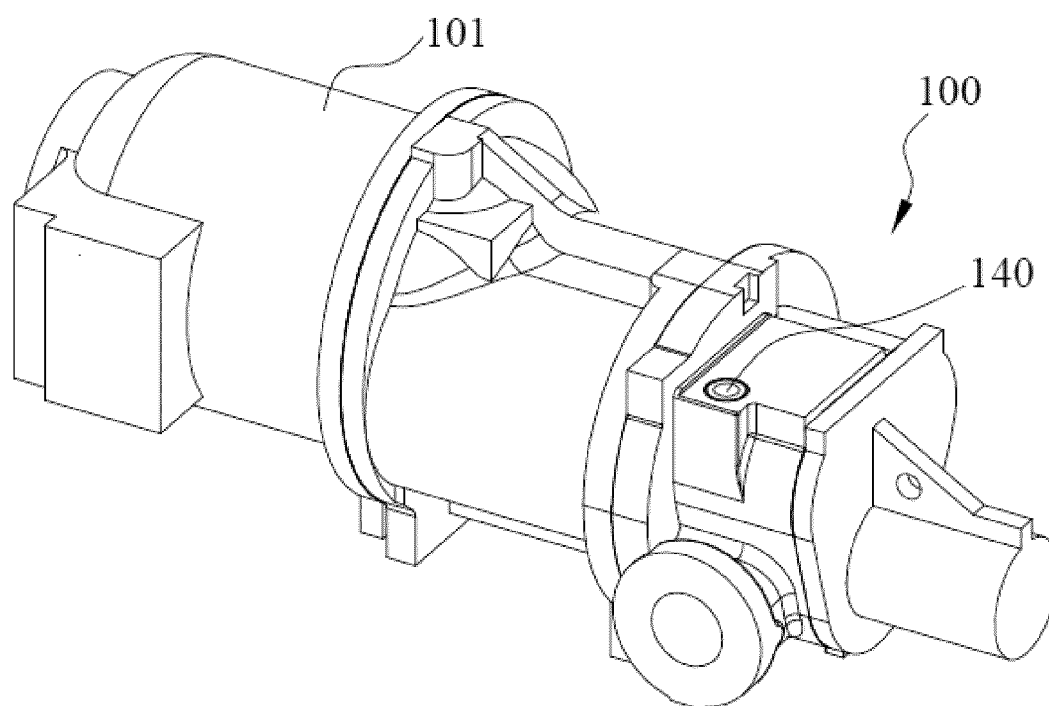


FIG. 1A

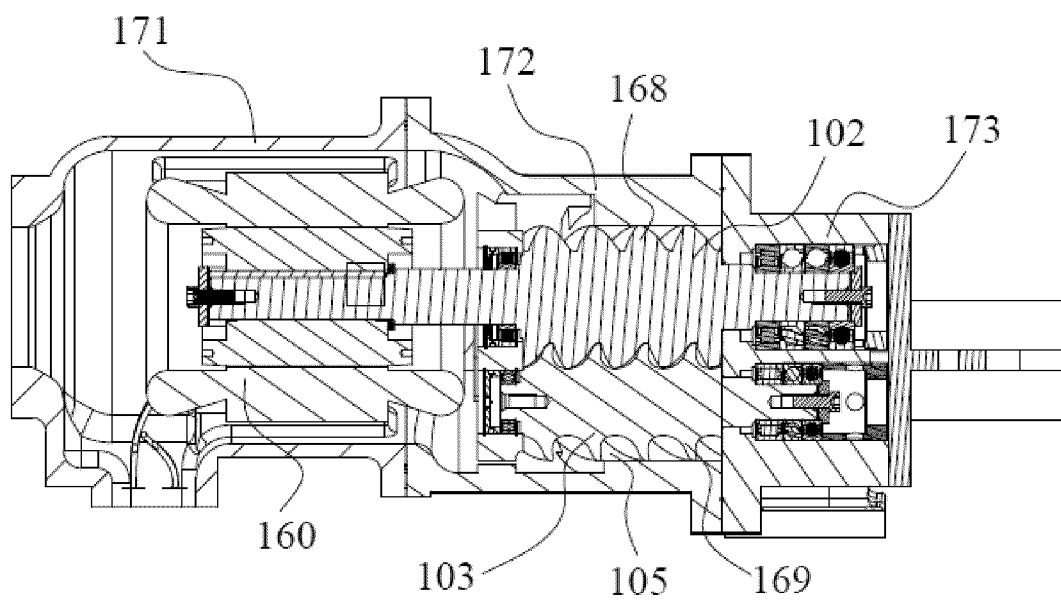


FIG. 1B

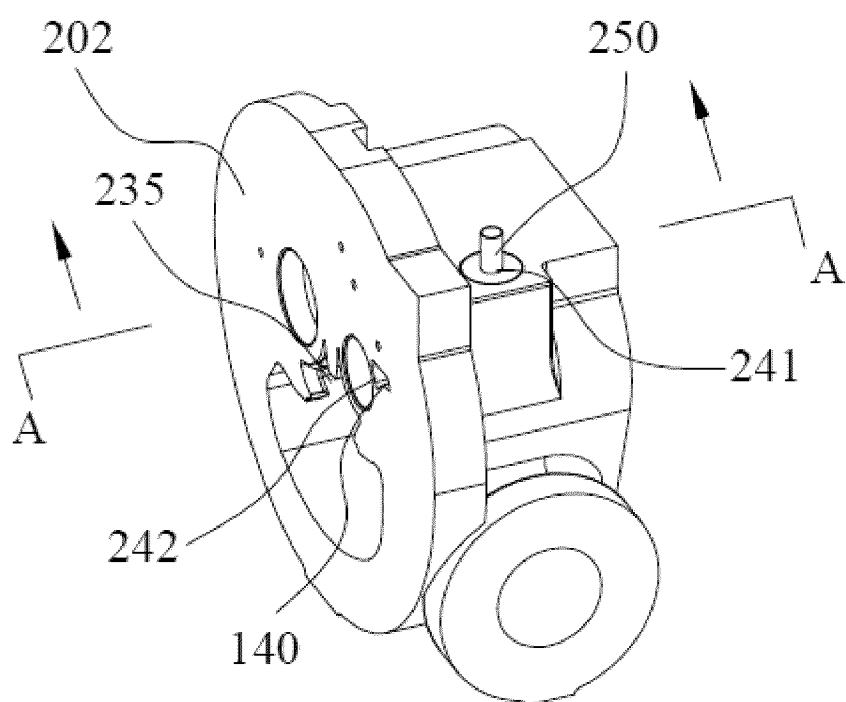


FIG. 2

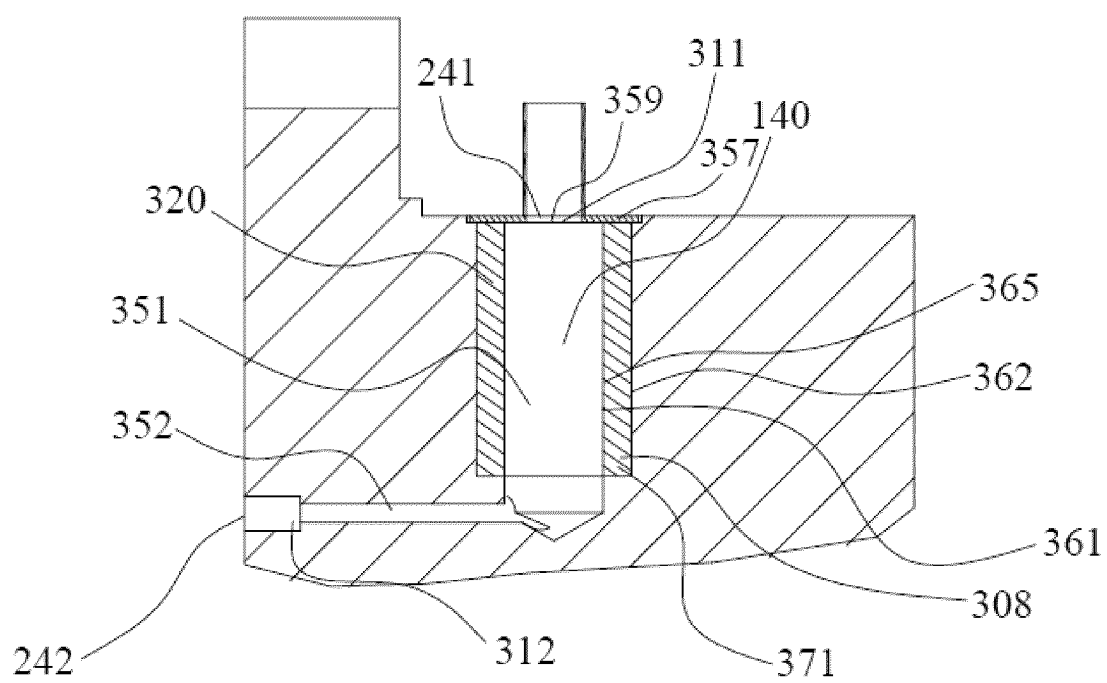


FIG. 3

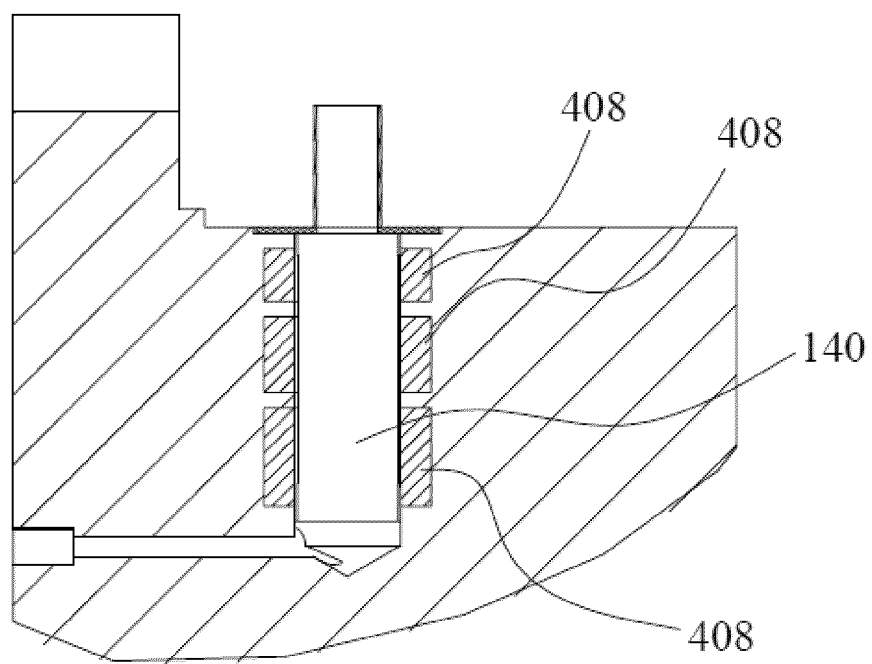


FIG. 4

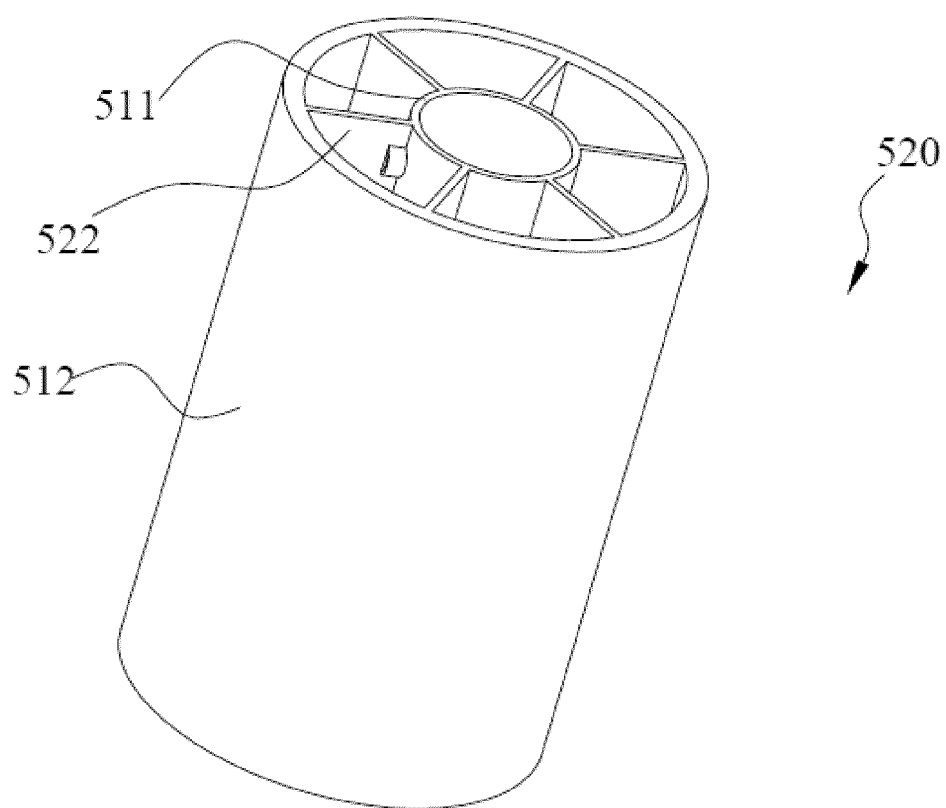


FIG. 5A

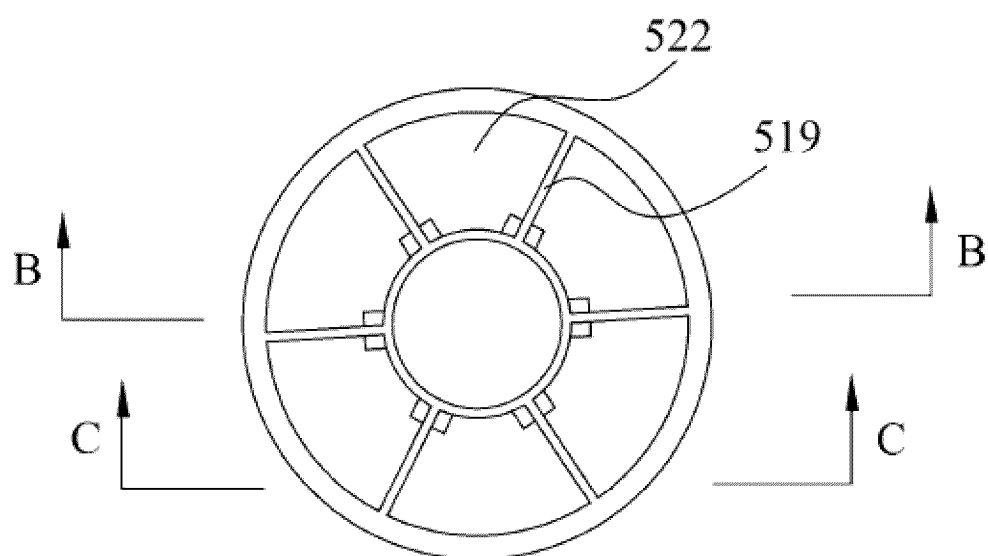


FIG. 5B

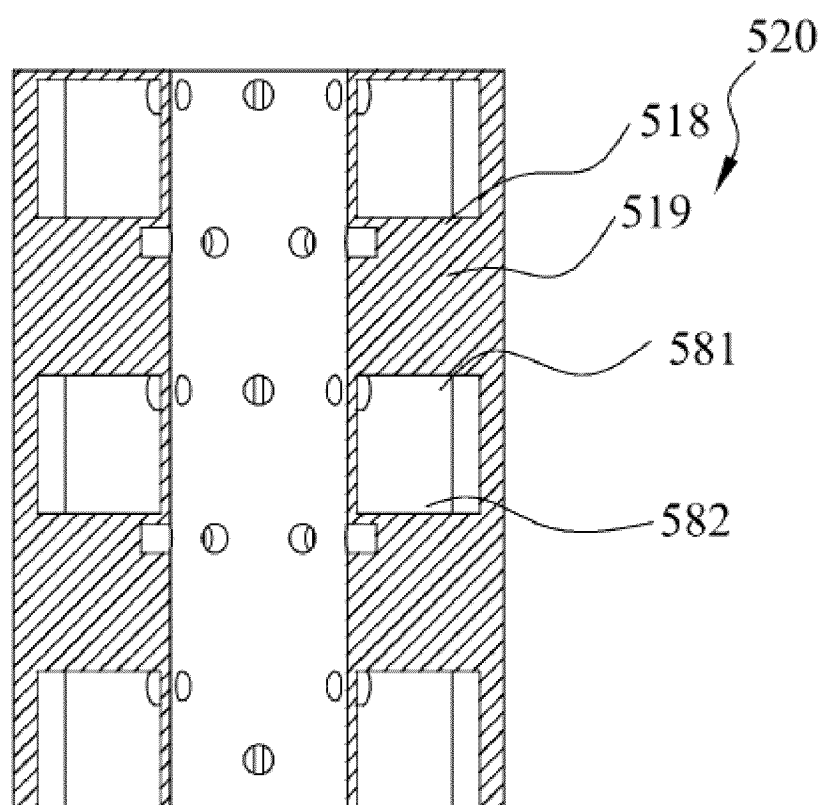


FIG. 5C

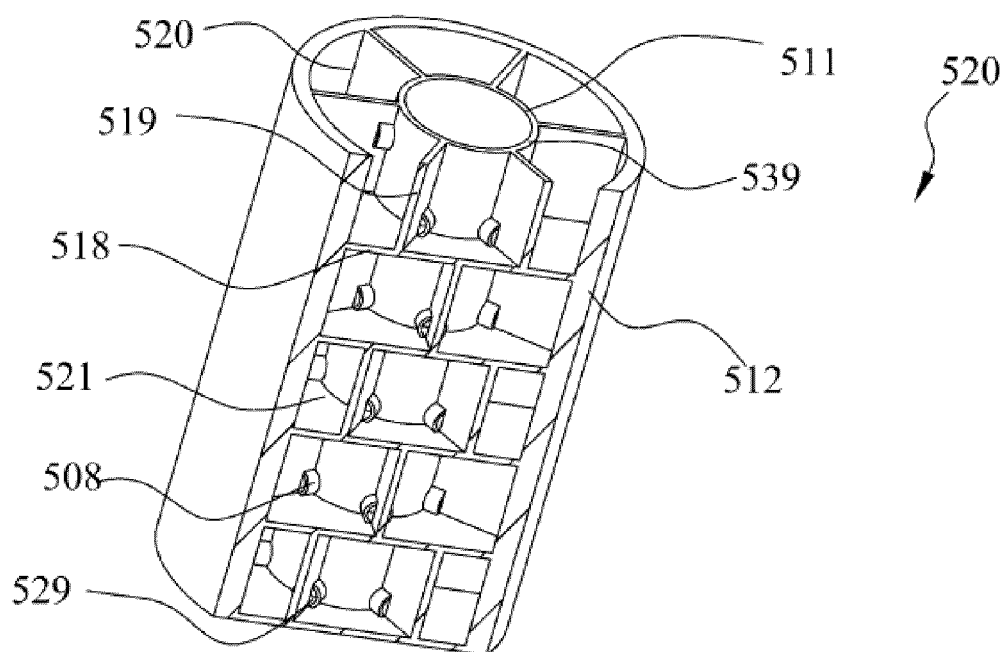


FIG. 5D

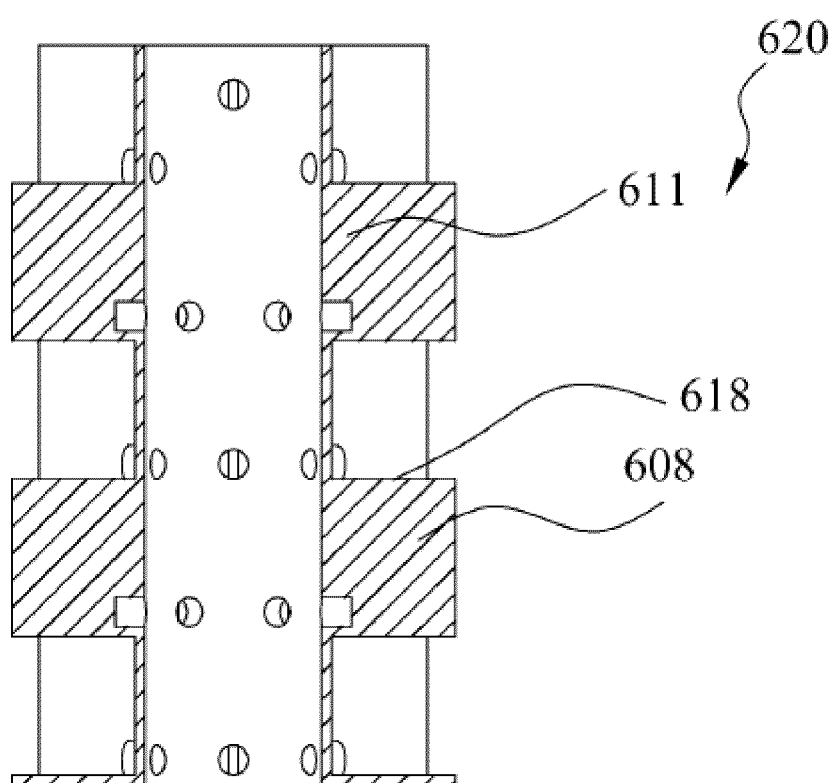


FIG. 6

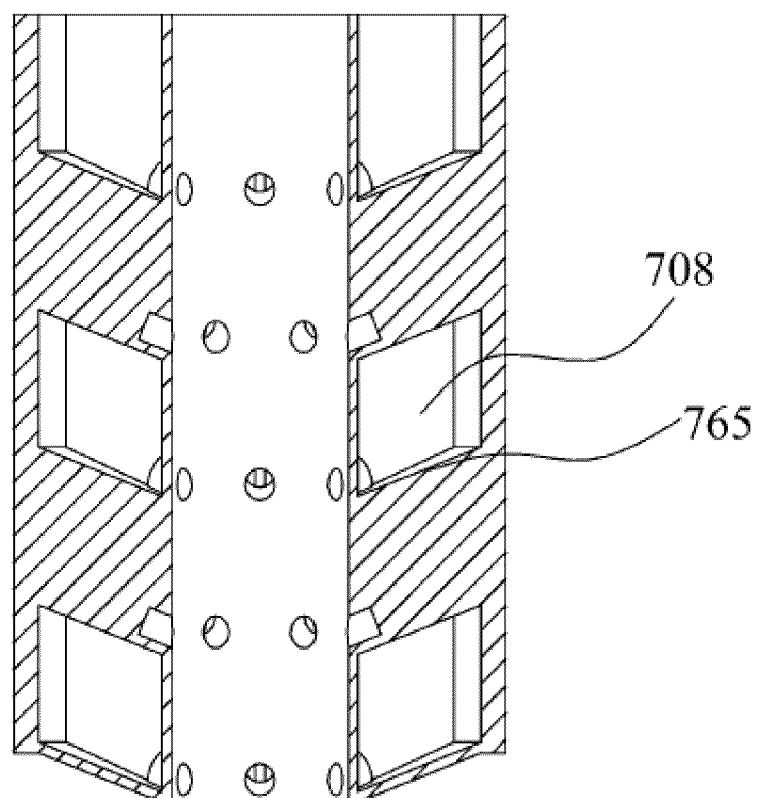


FIG. 7

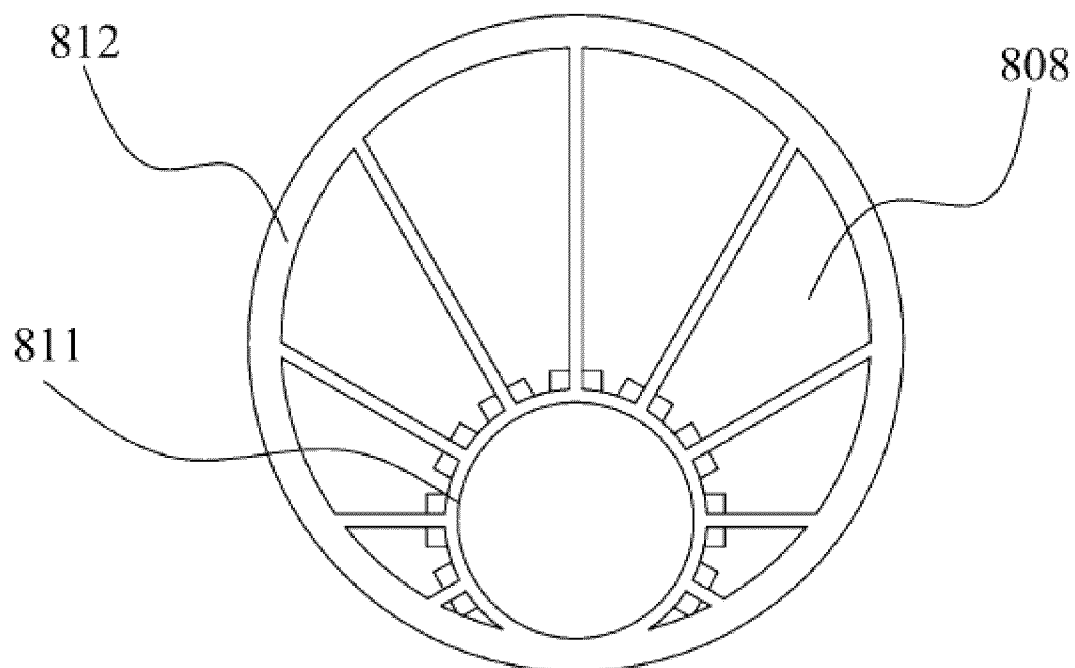


FIG. 8

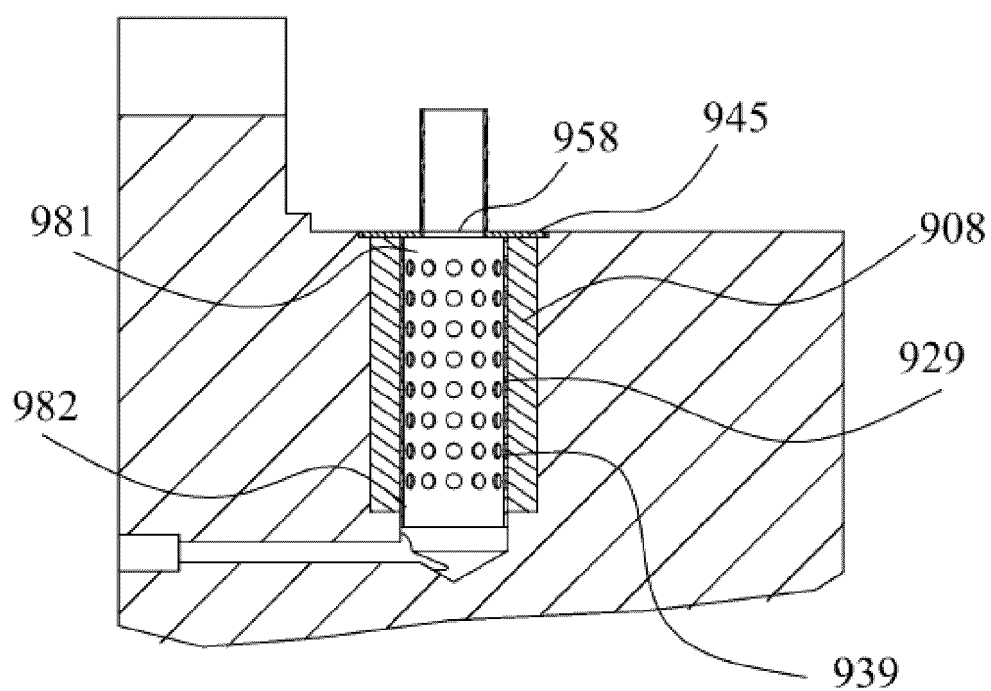


FIG. 9

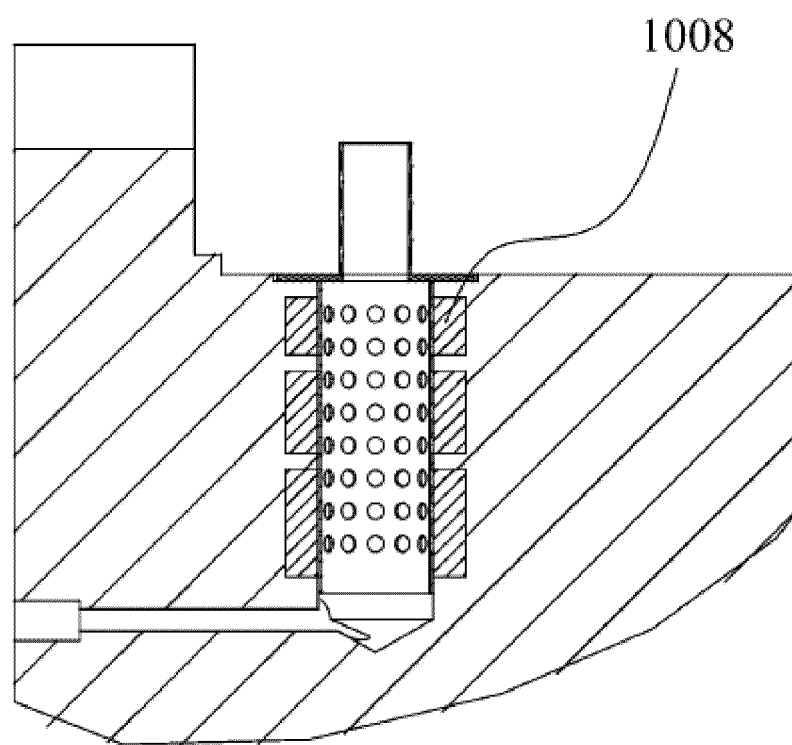


FIG. 10

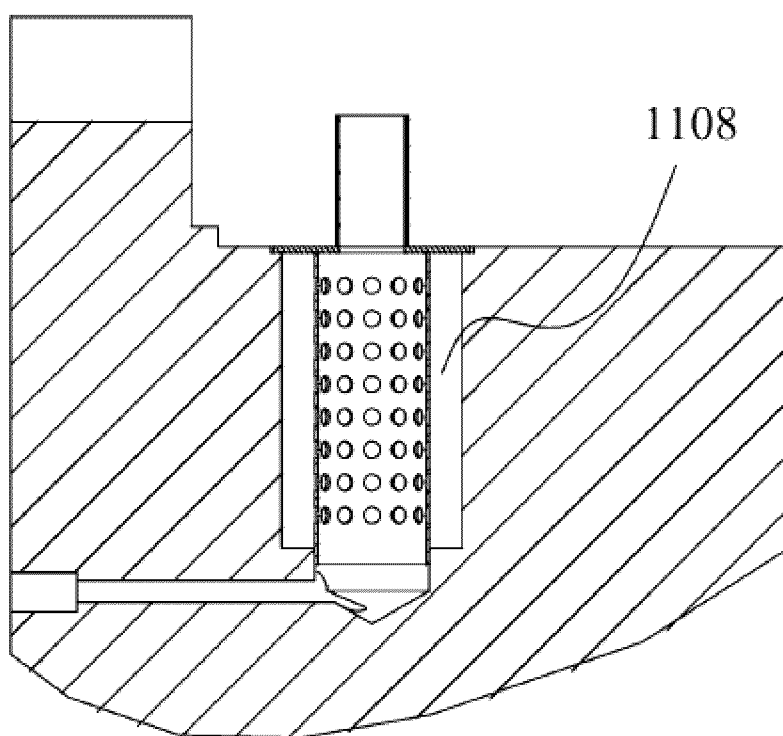


FIG. 11

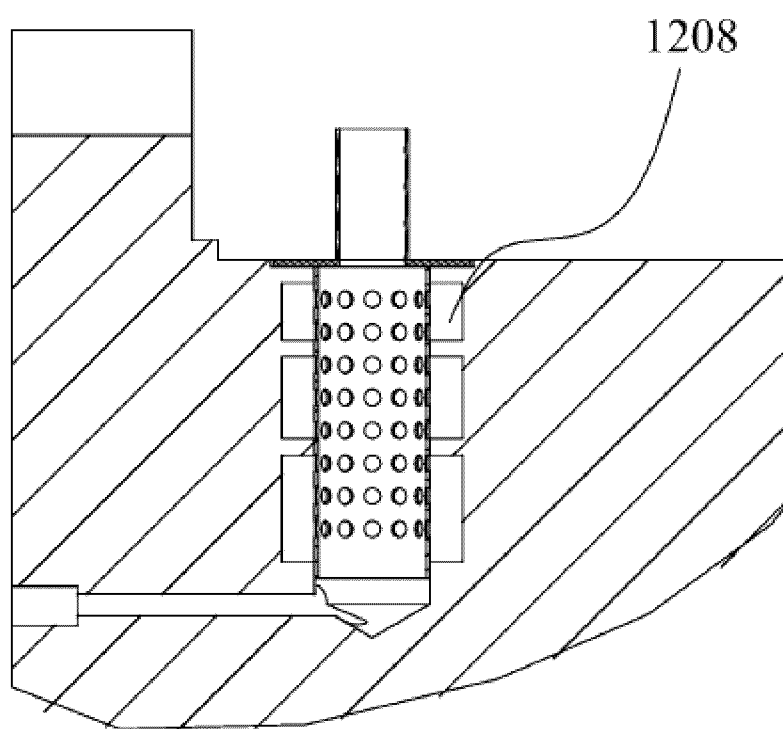


FIG. 12

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/110529

A. CLASSIFICATION OF SUBJECT MATTER

F04C29/06(2006.01)i; F04C29/12(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC: F04C

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNTXT, ENTXTC, VEN, DWPL, ENTXT: 交错, 经济器, 流道, 螺杆压缩机, 腔, 室, 通道, 吸入, 消声, 消音, 压缩机, 制冷剂, compressor, silenc+, chamber, passage, channel, cavity, noise

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 115324892 A (JOHNSON CONTROLS AIR-CONDITIONING & REFRIGERATION (WUXI) CO., LTD. et al.) 11 November 2022 (2022-11-11) claims 1-10	1-10
Y	CN 113513474 A (JOHNSON CONTROLS AIR-CONDITIONING & REFRIGERATION (WUXI) CO., LTD. et al.) 19 October 2021 (2021-10-19) description, paragraphs 2 and 40-50, and figures 1-5	1-10
Y	CN 207004830 U (SUZHOU AIBOTE PRECISION MACHINERY CO., LTD.) 13 February 2018 (2018-02-13) description, paragraphs 16-17, and figures 1-2	1-10
Y	CN 110805558 A (GREE GREEN REFRIGERATION TECHNOLOGY CENTER CO., LTD. OF ZHUHAI) 18 February 2020 (2020-02-18) description, paragraph 51	5
A	CN 105888899 A (ROECHLING AUTOMOTIVE SE & CO. KG) 24 August 2016 (2016-08-24) entire document	1-10

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

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“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

29 August 2023

Date of mailing of the international search report

11 October 2023

Name and mailing address of the ISA/CN

China National Intellectual Property Administration (ISA/
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Beijing 100088

Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/110529

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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A	EP 2216579 A1 (FESTO AG & CO., KG) 11 August 2010 (2010-08-11) entire document	1-10

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2023/110529

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