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(54) **ROTARY COMPRESSOR**

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(57) **ABSTRACT**

A rotary compressor for preventing, to the maximum extent possible, oil within the compressor from being discharged to a gas discharge port. The rotary compressor includes a drive device and a compression device which are mounted in a hermetic container. The hermetic container includes an upper cover formed with a gas discharge port. The rotary compressor includes a scroll chamber defined in an inner surface of the upper cover around the discharge port, to separate oil from gas to be discharged, and a discharge guiding member installed inside the upper cover, to guide the gas, discharged from the hermetic container, into the scroll chamber and to guide the gas, having passed through the scroll chamber, to the discharge port.

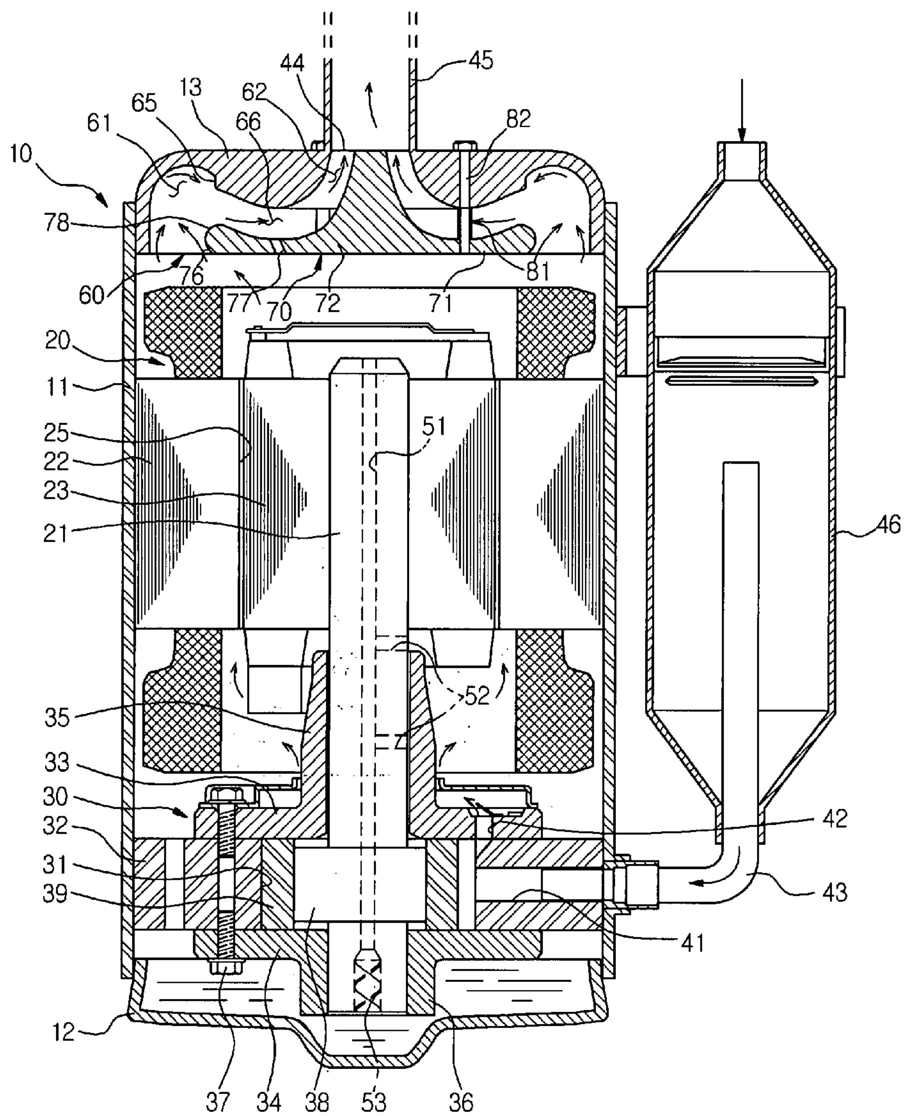

FIG.1

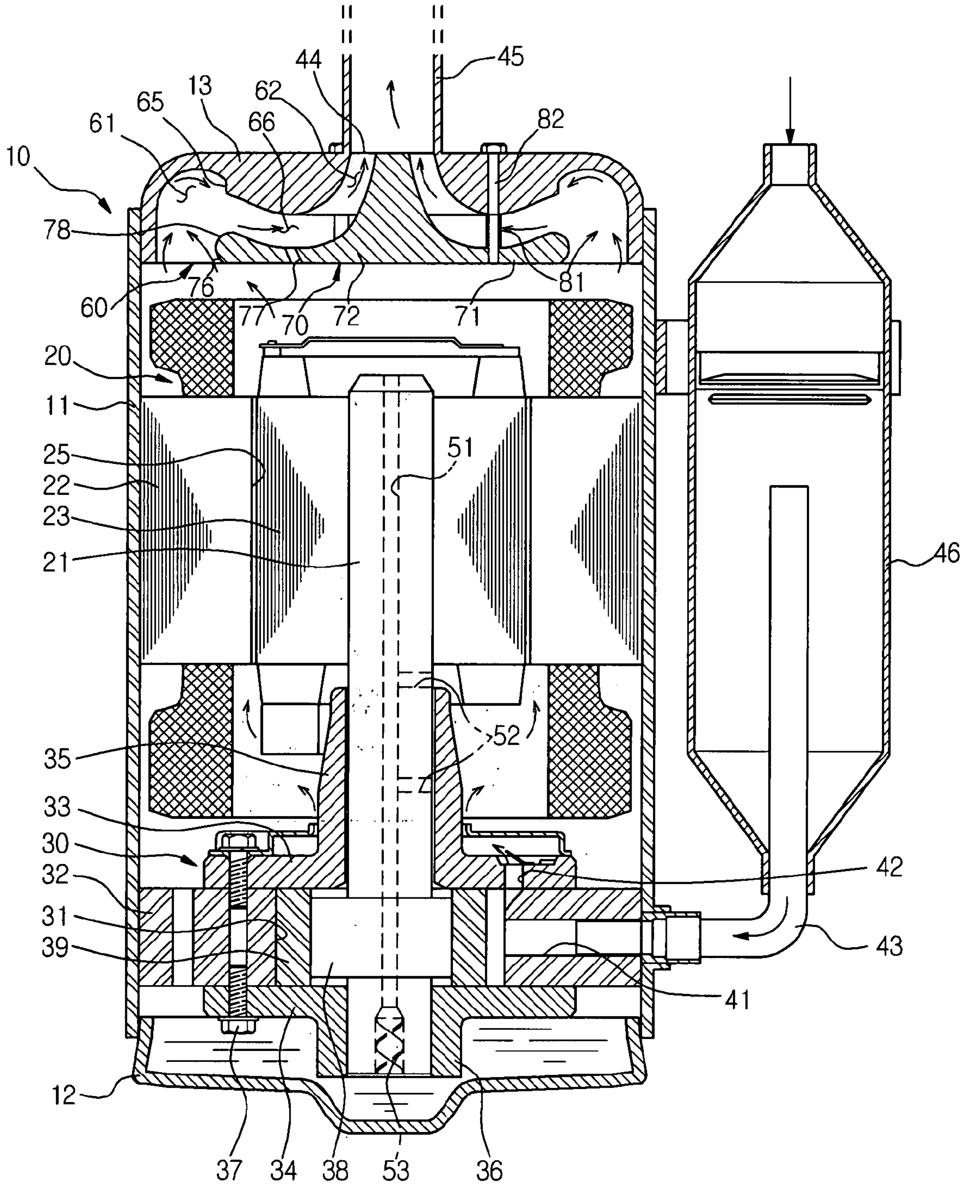

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FIG.2

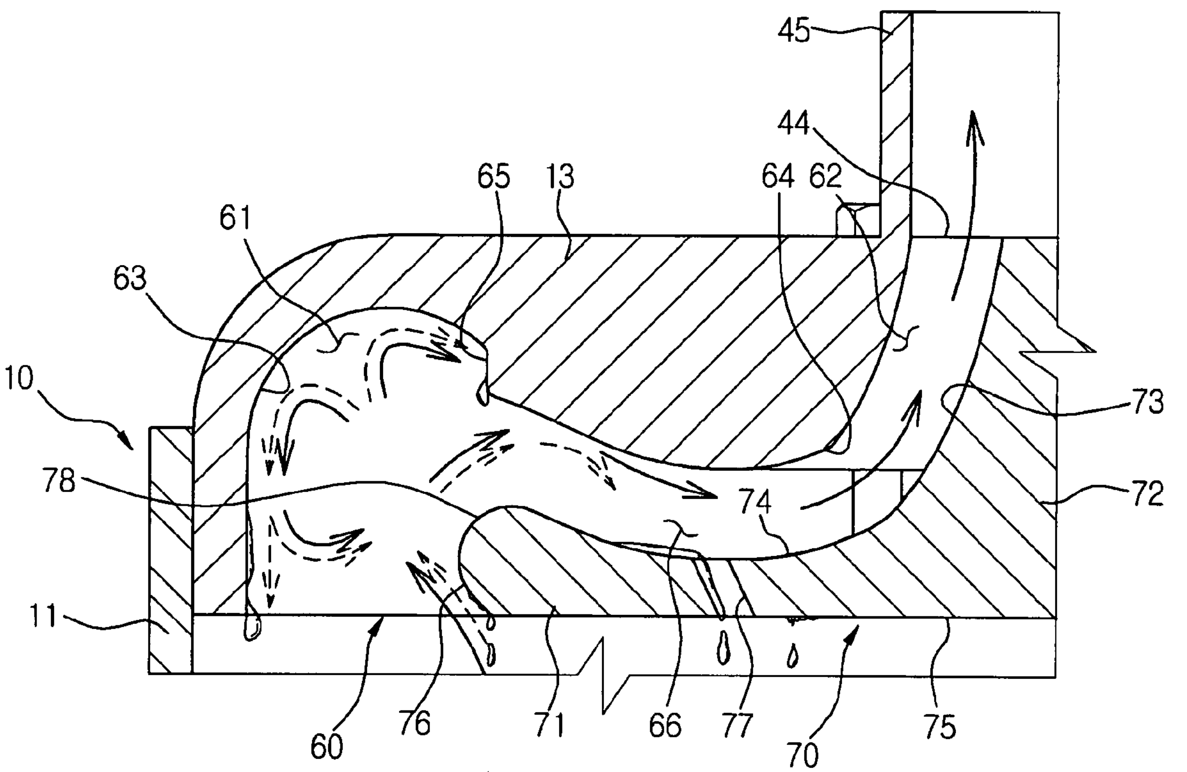


FIG.3

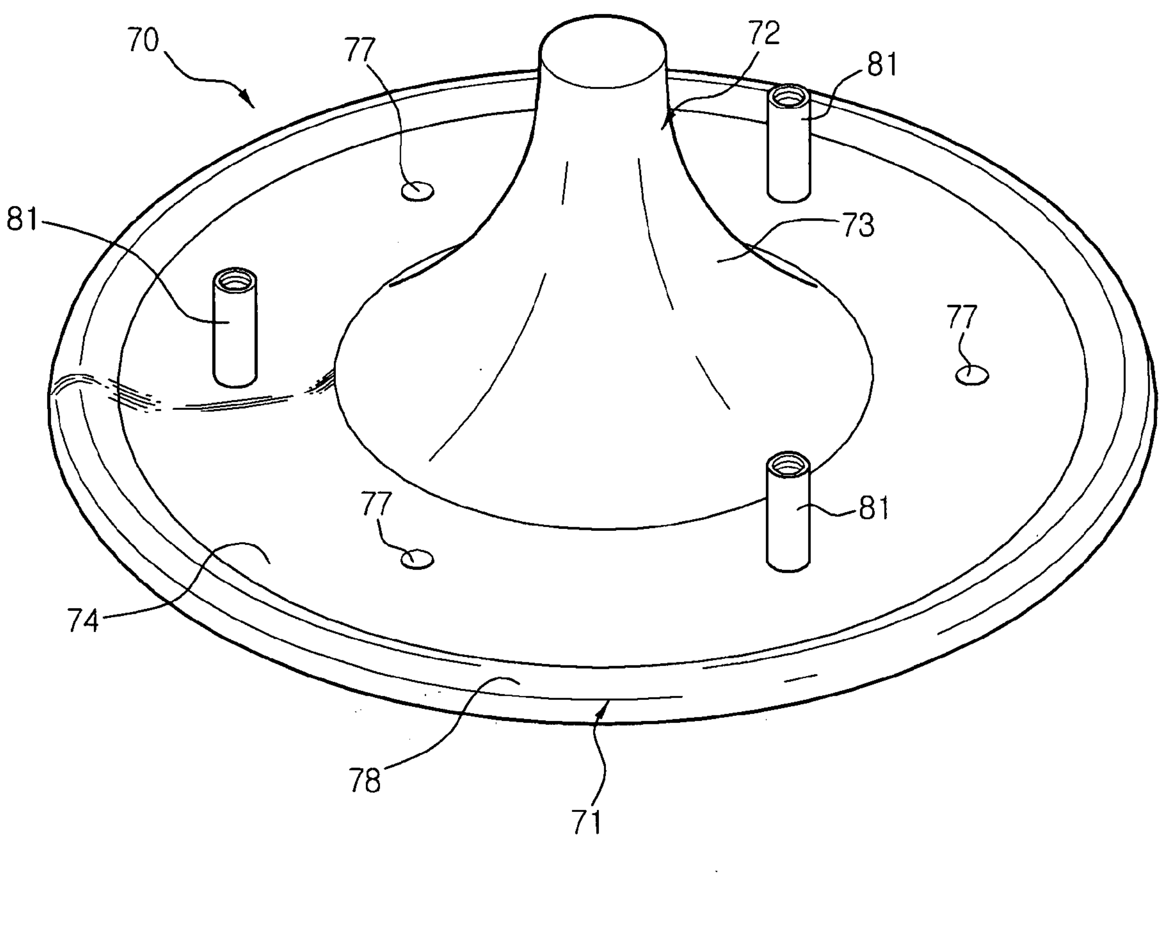


FIG.4

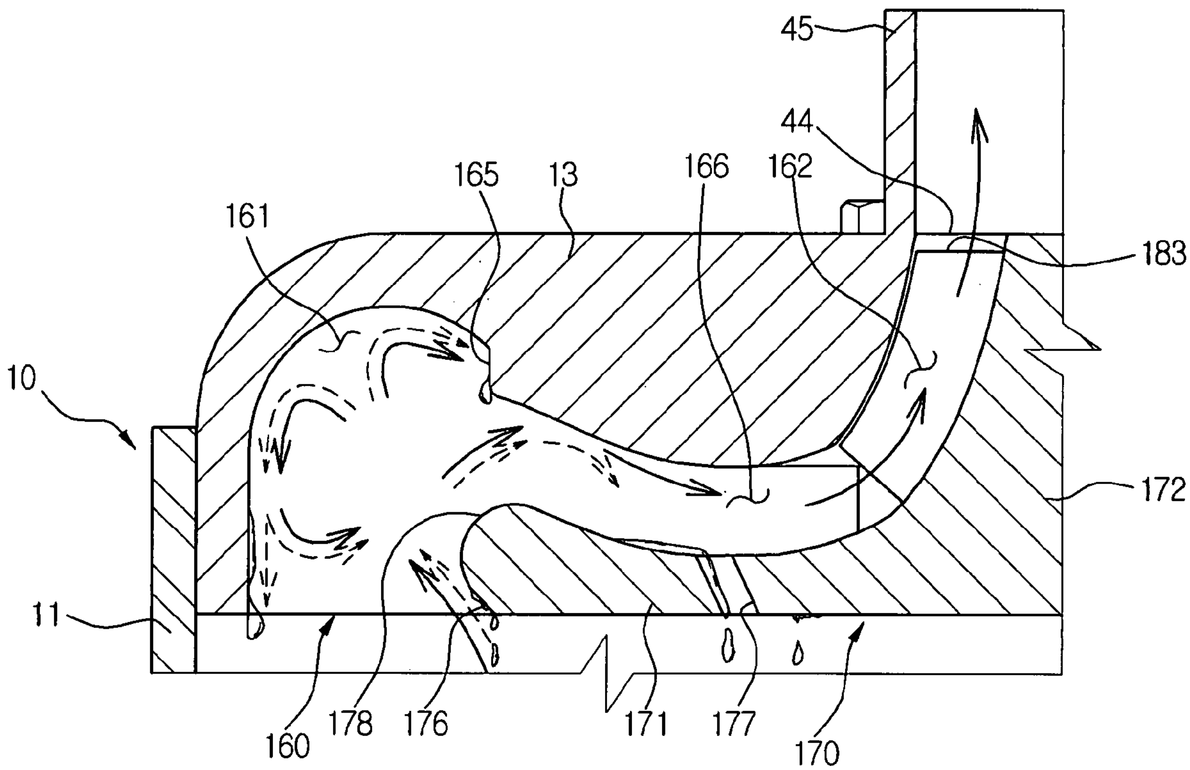


FIG.5

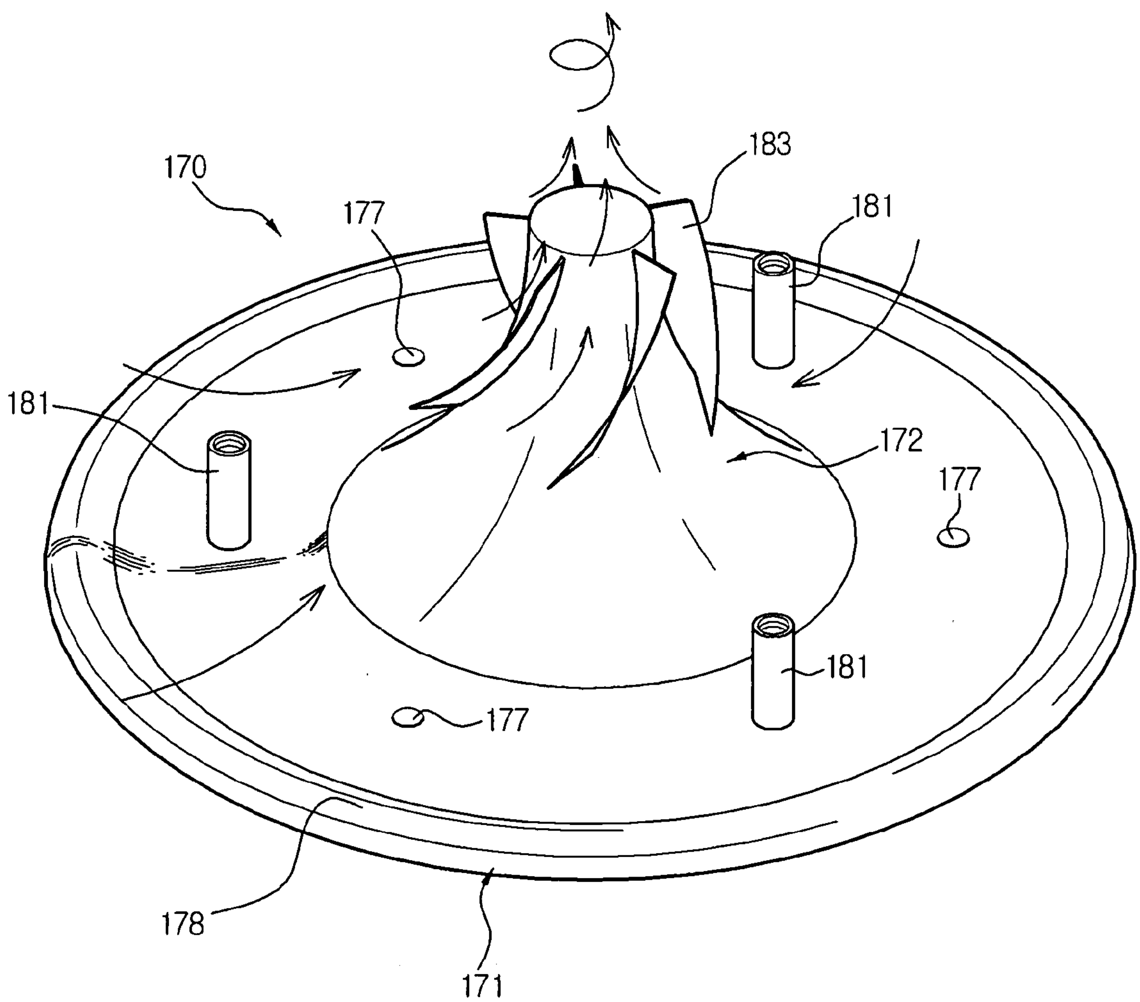
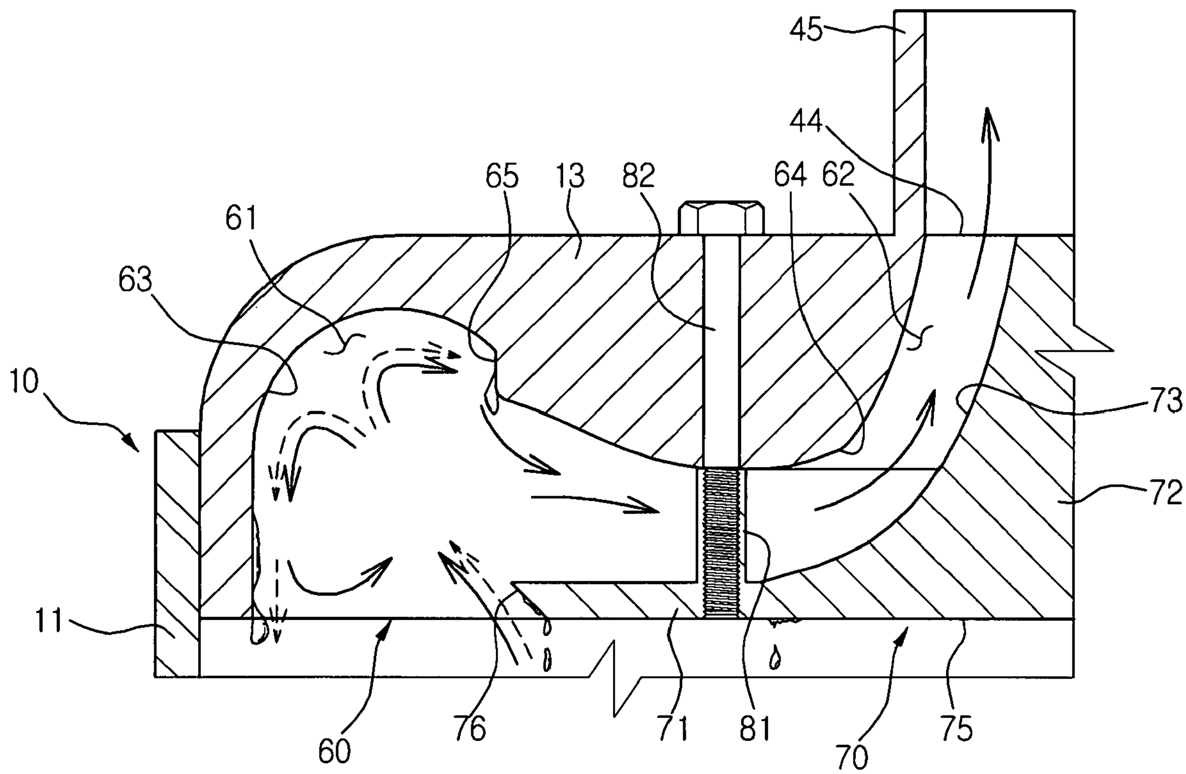


FIG.6



ROTARY COMPRESSOR

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of Korean Patent Applications No. 2006-0107236 and No. 2006-107235, filed on Nov. 1, 2006 in the Korean Intellectual Property Office, the disclosures of which are incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates to a rotary compressor, and, more particularly, to a rotary compressor capable of preventing, to the maximum extent possible, oil within the compressor from being discharged toward a refrigerant gas discharge port.

[0004] 2. Description of the Related Art

[0005] Korean Patent Laid-open Publication No 10-2004-0023069 (published on Mar. 18, 2004) discloses a rotary compressor in which an oil flow path is formed in a rotating shaft, to supply oil gathered in a bottom region of a hermetic container to a compression device during operation of the compressor.

[0006] The oil flow path includes an upright flow path perforated from a lower end to an upper end of the rotating shaft, and a radial communication flow path to communicate the upright flow path with an outer surface of the rotating shaft. When the rotating shaft is rotated at a high speed, accordingly, oil is ejected radially through the communication flow path and supplied to the compression device, thereby acting to lubricate or cool frictional portions of the compression device.

[0007] However, the above described rotary compressor has a problem in that the amount of oil gathered in the compressor may be gradually reduced as time passes. This is because particulate-phase oil, as a part of the oil radially ejected through the communication flow path, is mixed with refrigerant gas within the hermetic container to thereby be discharged toward a refrigerant gas discharge port.

[0008] If the amount of oil within the compressor is reduced, it is difficult to achieve efficient lubrication and cooling of the compression device and drive device of the compressor and consequently, the compressor may suffer from many problems, for example, overheating, malfunction, and performance degradation. Furthermore, the oil discharged through the discharge port along with the refrigerant gas may have a risk of forming an oil film at an inner surface of a heat exchanger or pipe included in a cooling system employing the compressor. This results in a degradation in the efficiency of heat exchange and consequently, a degradation in the performance of the cooling system.

SUMMARY OF THE INVENTION

[0009] The present invention has been made in order to solve the above problems. It is an aspect of the invention to provide a rotary compressor capable of preventing, to the maximum extent possible, oil within the compressor from being discharged toward a refrigerant gas discharge port.

[0010] Consistent with one aspect, an exemplary embodiment of the present invention provides a rotary compressor including a hermetic container, and a drive device and a compression device mounted in the hermetic container, the hermetic container having an upper cover formed with a gas discharge port, the rotary compressor further including: a scroll chamber defined in an inner surface of the upper cover around the discharge port, to separate oil from gas to be discharged; and a discharge guiding member installed inside the upper cover, to guide the gas, discharged from the hermetic container, into the scroll chamber and to guide the gas, having passed through the scroll chamber, to the discharge port.

[0011] The scroll chamber may be opened downwardly and include an inner curved surface upwardly recessed from the inner surface of the upper cover, the scroll chamber being circularly disposed around the discharge port.

[0012] The discharge guiding member may include: a circular plate portion installed below the discharge port so as to be spaced apart from the inner surface of the upper cover, an outer diameter of the circular plate portion being determined such that a rim of the circular plate portion is located close to the scroll chamber; and a protrusion portion protruding from an upper surface of the circular plate portion toward the discharge port, to guide discharge of the gas.

[0013] The rotary compressor may further include: a discharge flow path provided between the upper cover and the discharge guiding member to guide the gas from the scroll chamber to the discharge port, the discharge flow path having an U-shaped oil trap for separation of the oil from the gas; and an oil discharge hole formed in the discharge guiding member to discharge the oil gathered in a bottom region of the U-shaped oil trap.

[0014] The upper cover may include a bell-mouse shaped inner surface forming a top surface of the discharge flow path, and the protrusion portion may include a conical outer surface spaced apart from the bell-mouse shaped inner surface, the conical outer surface forming a bottom surface of the discharge flow path.

[0015] The conical outer surface of the protrusion portion and the upper surface of the circular plate portion may form a continuous curved surface together.

[0016] The upper surface of the circular plate portion may include an U-shaped curved surface forming a bottom surface of the U-shaped oil trap, the U-shaped curved surface and the conical outer surface of the protrusion portion forming a continuous curved surface together.

[0017] The rotary compressor may further include: a first raised oil-shield portion taking the form of a stepped portion provided at a boundary between the bell-mouse shaped inner surface of the upper cover and the scroll chamber and a second raised oil-shield portion taking the form of a convex curved portion provided on the rim of the circular plate portion, for separating the oil from the gas being introduced into the discharge flow path.

[0018] The discharge port may be provided at the center of the upper cover, and centers of the discharge port, the scroll chamber, and the discharge guiding member coincide with one another.

[0019] At least one whirling blade may be formed at an outer surface of the protrusion portion, to whirl the gas flowing to the discharge port.

[0020] An inclined guiding surface may be provided at the rim of the circular plate portion, to guide the rising gas from the interior of the hermetic container into the scroll chamber.

[0021] The rotary compressor may further include: a spacer member interposed between the discharge guiding member and the inner surface of the upper cover; and a fastening member to secure the discharge guiding member to the upper cover.

[0022] The drive device may include a stator secured to an inner surface of the hermetic container and a rotor rotatably installed inside the stator, and the oil discharge hole may be inclined toward the center of the rotor.

[0023] Additional aspects and/or advantages of the invention will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] These and/or other aspects and advantages of the exemplary embodiments of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings, of which:

[0025] FIG. **1** is a sectional view showing the configuration of a rotary compressor consistent with the present invention;

[0026] FIG. **2** is a sectional view showing an oil collecting device of the rotary compressor consistent with a first embodiment of the present invention;

[0027] FIG. **3** is a perspective view showing a discharge guiding member of the rotary compressor consistent with the first embodiment of the present invention;

[0028] FIG. **4** is a sectional view showing an oil collecting device of the rotary compressor consistent with a second embodiment of the present invention;

[0029] FIG. **5** is a perspective view showing a discharge guiding member of the rotary compressor consistent with the second embodiment of the present invention; and

[0030] FIG. **6** is a sectional view showing an oil collecting device consistent with a third embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0031] Reference will now be made in detail to exemplary embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout. The embodiments are described below to explain the present invention by referring to the figures.

[0032] The rotary compressor consistent with the present invention, as shown in FIG. **1**, includes a hermetic container **10**, a drive device **20** installed in an upper region of the hermetic container **10** and adapted to generate a rotating force, and a compression device **30** installed in a lower region of the hermetic container **10** and connected to the drive device **20** through a rotating shaft **21**.

[0033] The hermetic container **10** includes a cylindrical body **11**, a lower cover **12** coupled to a lower end of the body **11**, and an upper cover **13** coupled to an upper end of the body **11**. Both the lower cover **12** and the upper cover **13** are coupled to the body **11** by welding, etc., so as to seal the upper and lower ends of the body **11**.

[0034] The drive device **20** includes a cylindrical stator **22** secured to an inner surface of the body **11** of the hermetic container **10**, and a rotor **23** rotatably installed inside the stator **22** and centrally coupled to the rotating shaft **21**.

[0035] The compression device **30** includes a cylinder body **32** centrally defining a cylindrical compression chamber **31** therein, and upper and lower flanges **33** and **34** coupled to upper and lower surfaces of the cylinder body **32** to cover upper and lower ends of the cylinder body **32**. The upper flange **33** has a cylindrical upper shaft supporting portion **35**, which extends upward from the flange **33** by a predetermined length to support the rotating shaft **21**. The lower flange **34** has a cylindrical lower shaft supporting portion **36**, which extends downward from the flange **34** by a predetermined length to support the rotating shaft **21**. All the upper flange **33**, cylinder body **32**, and lower flange **34** are firmly coupled with one another by means of a plurality of fastening bolts **37**. The cylinder body **32** has an outer diameter corresponding to an inner diameter of the hermetic container **10** such that the cylinder body **32** is secured close to the inner surface of the hermetic container **10**. The rotating shaft **21** is penetrated through the center of the compression chamber **31** and rotatably supported by both the upper shaft supporting portion **35** and the lower shaft supporting portion **36**.

[0036] The compression device **30** further includes an eccentric portion **38** located in the compression chamber **31** around the rotating shaft **21**, and a ring piston **39** rotatably installed to an outer surface of the eccentric portion **38**, the ring piston **39** having an outer surface coming into contact with an inner surface of the compression chamber **31**. Although not shown in the drawings, the compression device **30** further includes a vain that is reciprocally movable in a radial direction by rotation of the ring piston **39** so as to divide the interior of the compression chamber **31** into a suction part and a discharge part, and a vain spring to press the vane toward the ring piston **39**.

[0037] The cylinder body **32** has a suction port **41** that communicates with the suction part of the compression chamber **31** to allow refrigerant gas to be introduced into the compression chamber **31**. The upper flange **33** has a discharge port **42** for discharge of the compressed refrigerant gas. The suction port **41** is connected to a refrigerant suction pipe **43** such that low-pressure refrigerant delivered from an evaporator of a general cooling system is introduced into the suction port **41**. The upper cover **13** of the hermetic container **10** has a discharge port **44** formed at the center thereof for discharging the compressed refrigerant gas out of the hermetic container **10**. The discharge port **44** is connected to a discharge pipe **45**. In FIG. **1**, reference numeral **46** denotes an accumulator coupled to the refrigerant suction pipe **43**.

[0038] The rotating shaft **21** has a first oil flow path **51** and a second oil flow path **52** formed therein, to supply oil filled in a bottom region of the hermetic container **10** to frictional portions of the compression device **30**. The first oil flow path **51** is perforated through the rotating shaft **21** from a lower end to an upper end of the rotating shaft **21**, and the second oil flow path **52** is formed in a radial direction of the rotating shaft **21** to communicate the first oil flow path **51** with the outside of the rotating shaft **21**. If necessary, a plurality of second oil flow paths **52** may be provided at different positions including an upper position or an intermediate position of the upper shaft supporting portion **35**. With this configuration, if oil rises along the first oil flow path **51** by a centrifugal force generated during rotation of the rotating shaft **21**, the oil is scattered out of the rotating shaft **21** through the second oil flow path **52**, so as to be supplied to frictional potions of the compression device **30**. To facilitate the rising of the oil through the first oil flow path **51**, an oil pickup member **53** having a spiral blade shape may be installed at a lower end of the first oil flow path **51**.

[0039] In the above described rotary compressor, if the rotating shaft **21** is rotated by operation of the drive device **20**, the eccentric portion **38** within the compression chamber **31** is rotated, and simultaneously the ring piston **39** is eccentrically rotated in the compression chamber **31** by operation of the eccentric portion **38**. With the eccentric rotation of the ring piston **39**, the suction part and the discharge part of the compression chamber **31** have a variation in volume. As a result, refrigerant gas is suctioned into the compression chamber **31** through the suction port **41**. After being compressed in the compression chamber **31**, the refrigerant gas is discharged to the interior of the hermetic container **10** through the discharge port **42**. The compressed refrigerant gas within the hermetic container **10** flows upward through a gap **25** between the stator **22** and the rotor **23**, to thereby be discharged into the discharge pipe **45** through the discharge port **44** of the upper cover **13**. During the above described operation of the compression device **30**, oil is supplied to frictional portions of the compression device **30** through the first and second oil flow paths **51** and **52**, so as to achieve lubrication and cooling of the compression device **30**.

[0040] Meanwhile, during the above described compressing operation, particulate-phase oil scattered from the second oil flow path **52** may flow toward the discharge port **44** of the upper cover **13** along with the compressed refrigerant gas. In the present invention, an oil collecting device **60** is provided in the upper cover **13** to collect the scattered oil, so as to prevent the discharge of oil to the maximum extent possible. Hereinafter, the oil collecting device **60** will be described.

[0041] FIGS. **2** and **3** illustrate the oil collecting device **60** consistent with a first embodiment of the present invention. The oil collecting device **60** of the first embodiment, as shown in FIG. **2**, includes a scroll chamber **61** defined in an inner surface of the upper cover **13**, and a discharge guiding member **70** installed near the inner surface of the upper cover **13** to define a discharge flow path **62** along with the inner surface of the upper cover **13**, the discharge guiding member **70** allowing the refrigerant gas within the hermetic container **10** to be discharged to the discharge port **44** by way of the scroll chamber **61**. The discharge flow path **62** has an U-shaped oil trap **66** for collecting the oil in the course of discharging the refrigerant gas. The discharge guiding member **70** has a plurality of oil discharge holes **77** for discharging the oil gathered in the U-shaped oil trap **66**.

[0042] The scroll chamber **61** is defined in the inner surface of the upper cover **13** at a position close to a side surface of the upper cover **13**, to have a circular shape encircling the discharge port **44**. The scroll chamber **61** has an inner curved surface **63** that is upwardly recessed from the inner surface of the upper cover **13**. The scroll chamber **61** is opened downwardly for allowing the rising refrigerant gas to be introduced into the scroll chamber **61**. The inner curved surface **63** of the scroll chamber **61** has a semicircular or oval cross section.

[0043] The upper cover **13** has a bell-mouse shaped inner surface **64**, which is connected to the discharge port **44** so as to guide the refrigerant gas, having passed through the scroll chamber **61**, to the discharge port **44**, the bell-mouse shaped inner surface **64** forming a top surface of the discharge flow path **62**. The discharge guiding member **70** is spaced apart downward from the bell-mouse shaped inner surface **64**, to define the discharge flow path **62** along with the bell-mouse shaped inner surface **64**. That is to say, the discharge guiding member **70** forms a bottom surface of the discharge flow path **62**.

[0044] The discharge guiding member **70**, as shown in FIGS. **2** and **3**, includes a circular plate portion **71** spaced apart from the inner surface of the upper cover **13**, an outer diameter of the circular plate portion **71** being determined such that a rim of the circular plate portion **71** is located adjacent to the scroll chamber **61**, and a protrusion portion **72** protruding from the center of an upper surface of the circular plate portion **71** toward the discharge port **44**. The protrusion portion **72** has a conical outer surface **73** spaced apart from the bell-mouse shaped inner surface **64** of the upper cover **13**. The upper surface of the circular plate portion **71** has an U-shaped curved surface **74** forming a bottom surface of the U-shaped oil trap **66**. The U-shaped curved surface **74** and the conical outer surface **73** of the protrusion portion **72** form a continuous curved surface. The oil discharge holes **77** are perforated from the deepest position of the U-shaped curved surface **74** to a lower surface **75** of the circular plate portion **71**. This is to allow the oil gathered in the U-shaped oil trap **66** to fall down through the oil discharge holes **77**. In this case, it is desirable that the oil discharge holes **77** be located as close as possible to the center of the rotor **23**, or be inclined toward the center of the rotor **23** for the sake of efficient falling of the oil. This is to prevent the oil falling from the oil discharge holes **77** to avoid a stream of the refrigerant gas rising through the gap **25** between the stator **22** and the rotor **23**, thereby preventing, to the maximum extent possible, the falling oil from being introduced again into the scroll chamber **61** by the rising stream of the refrigerant gas.

[0045] With the above described configuration, the upper surface of the discharge guiding member **70** and the bell-mouse shaped inner surface **64** of the upper cover **13** define the curved discharge flow path **62** having a low flow resistance, thereby allowing the refrigerant gas to be efficiently discharged from the scroll chamber **61** toward the discharge port **44**. To ensure efficient discharge of the refrigerant gas, it is desirable that centers of the discharge port **44**, scroll chamber **61**, and discharge guiding member **70** coincide with one another, to allow a length of the discharge flow path **62** from the scroll chamber **61** to the discharge hole **44** to be constant in all directions.

[0046] As shown in FIG. **2**, the circular plate portion **71** of the discharge guiding member **70** has an inclined guiding surface **76** formed at the lower side of the rim thereof. The inclined guiding surface **76** serves to guide the rising refrigerant gas from the interior of the hermetic container **10** into a corner of the scroll chamber **61**. Accordingly, after the rising refrigerant gas collides against the inner surface of the scroll chamber **61**, the refrigerant gas temporarily stays in the scroll chamber **61** so as to be whirled in the scroll chamber **61**. This is to allow the oil, which is rising along with the refrigerant gas, to be adhered to the inner curved surface **63** of the scroll chamber **61**, so as to be separated from the refrigerant gas.

[0047] To facilitate separation of the oil from the refrigerant gas being introduced into the discharge flow path **62** through the scroll chamber **61**, a first raised oil-shield portion **65** and a second raised oil-shield portion **78** are formed at an entrance side of the discharge flow path **62**. The first oil-shield portion **65** is a stepped portion formed at a boundary between the bell-mouse shaped inner surface **64** of the upper cover **13** and the scroll chamber **61**. The second oil-shield portion **78** is a convex curved portion formed at the upper side of the rim of the circular plate portion **71**. As the oil contained in the refrigerant gas flows from the scroll chamber **61** into the discharge flow path **62**, the oil is able to be separated from the refrigerant gas by colliding against the first and second raised oil-shield portions **65** and **78**. Accordingly, the first and second raised oil-shield portions **65** and **78** have the effect of improving the separation efficiency of the oil.

[0048] As shown in FIGS. **1** and **3**, a plurality of spacer members **81** are provided at the upper surface of the discharge guiding member **70**, to space the discharge guiding member **70** apart from the inner surface of the upper cover **13**. A plurality of fastening screws **82** for securing the discharge guiding member **70** to the upper cover **13** are fastened into the spacer members **81**. Although the spacer members **81** are integrally formed with the discharge guiding member **70** as illustrated in FIG. **3**, the spacer members **81** may be formed as separate elements. Further, although the fastening bolts **82** are fastened into the spacer members **81** by penetrating through the upper cover **13** as illustrated in FIG. **1**, the present invention is not limited thereto, and the fastening bolts **82** may be fastened by penetrating through the discharge guiding member **70**. Alternatively, the discharge guiding member **70** may be secured to the upper cover **13** by other fastening means, for example, protruded portions of the discharge guiding member **70**, rather than the fastening bolts.

[0049] Now, an oil collecting operation performed by the above described oil collecting device **60** will be described.

[0050] As shown in FIG. **2**, the rising refrigerant gas from the interior of the hermetic container **10** collides against the lower surface **75** of the discharge guiding member **70** and thus, further rising of the refrigerant gas is not allowed. Therefore, the refrigerant gas is guided toward the scroll chamber **61**, and more particularly, guided to the corner of the scroll chamber **61** by the inclined guiding surface **76** provided at the rim of the discharge guiding member **70**. Accordingly, the oil, which rises along with the refrigerant gas, collides against the lower surface **75** and the inclined guiding surface **76** of the discharge guiding member **70**, to thereby be adhered thereto. This causes an increase in the size of oil droplets, thus causing the oil to fall down. Also, once the oil is introduced into the scroll chamber **61** along with the refrigerant gas, the oil collides against the inner curved surface **63** of the scroll chamber **61** to thereby be adhered to the inner curved surface **63** and consequently, the oil falls down along the inner surface of the scroll chamber **61**.

[0051] The refrigerant gas, having passed through the scroll chamber **61**, flows toward the discharge port **44** through the discharge flow path **62**. Similarly, a part of the oil contained in the refrigerant gas collides against the first and second raised oil-shield portions **65** and **78** provided at the entrance side of the discharge flow path **62**, thereby being separated from the refrigerant gas. Furthermore, in the course that the refrigerant gas passes through the U-shaped oil trap **66** of the discharge flow path **62**, the oil is adhered to the inner surface of the U-shaped oil trap **66** to thereby be separated from the refrigerant gas. In this case, the oil gathered in the bottom region of the U-shaped oil trap **66** falls down through the oil discharge holes **77**.

[0052] As stated above, in the present invention, the oil is primarily separated from the refrigerant gas by the lower surface **75** and the inclined guiding surface **76** of the discharge guiding member **70**, secondarily separated in the scroll chamber **61**, and thirdly separated by the first and second raised oil-shield portions **65** and **78**. In addition, the oil is fourthly separated by the U-shaped oil trap **66** of the discharge flow path **62**. Consequently, the discharge of oil through the discharge port **44** can be prevented to the maximum extent possible.

[0053] The discharge flow path **62** is tapered such that a cross section of the discharge flow path **62** gradually decreases from the scroll chamber **61** to the discharge port **44**. Accordingly, the pressure of the refrigerant gas increases in the course of being discharged through the discharge flow path **62**. That is to say, the refrigerant gas to be discharged is gathered from the surrounding scroll chamber **61** to the discharge port **44** through the discharge flow path **62** and thus, subjected to an increase in pressure in the course of being discharged.

[0054] FIGS. **4** and **5** illustrate an oil collecting device consistent with a second embodiment of the present invention. As compared to that of the above described first embodiment, the oil collecting device **160** of the second embodiment further includes a plurality of whirling blades **183**, which are installed at an outer surface of a protrusion portion **172** of a discharge guiding member **170** to cause the discharge gas to be whirled. Other configurations of the present embodiment are identical to those of the first embodiment. For example, a scroll chamber **161**, first and second raised oil-shield portions **165** and **178**, circular plate portion **171** of the discharge guiding member **170**, inclined guiding surface **176** of the circular plate portion **171**, U-shaped oil trap **166**, oil discharge holes **177**, spacer members **181**, and the like are identical to those of the first embodiment.

[0055] The plurality of whirling blades **183** are spirally bent in a rotating direction of the rotor **23** of the drive device **20**. With this configuration, the whirling blades **183** produce a whirling stream of the refrigerant gas having the same direction as the rotating direction of the rotor **23** and this has the effect of facilitating the flow of the refrigerant gas to be discharged to the discharge port **44**. Specifically, since the rising refrigerant gas from the interior of the hermetic container **10** is introduced into the scroll chamber **161** while being whirled in a predetermined direction by a rotating movement of the rotor **23**, the refrigerant gas has a tendency of being whirled in the predetermined direction when being discharged from the scroll chamber **161** into a discharge flow path **162**. Accordingly, by guiding the discharge refrigerant gas to be whirled in the predetermined direction (i.e. in the rotating direction of the rotor **23**) by the whirling blades **183**, it is possible to achieve efficient flow of the refrigerant gas to be discharged.

[0056] FIG. **6** illustrates an oil collecting device consistent with a third embodiment of the present invention. As compared to the above described first embodiment, the oil collecting device of the third embodiment has no U-shaped oil trap and oil discharge holes. In this case, the circular plate portion **71** has a flat upper surface. Other configurations of the present embodiment are identical to those of the first embodiment.

[0057] As apparent from the above description, the present invention provides a rotary compressor having the following effects.

[0058] Firstly, according to the present invention, oil contained in refrigerant gas to be discharged is primarily separated by a lower surface and an inclined guiding surface of a discharge guiding member, secondarily separated by an inner surface of a scroll chamber, and thirdly separated in the course of passing through a discharge flow path. This has the effect of preventing the discharge of oil through a refrigerant gas discharge port to the maximum extent possible.

[0059] Secondly, in the course of being discharged through the discharge flow path, the oil is separated by first and second raised oil-shield portions and additionally, separated by an U-shaped trap of the discharge flow path, so as not to be discharged out of the compressor to the maximum extent possible.

[0060] Thirdly, the present invention has the function of collecting the oil, gathered in the discharge flow path, by use of oil discharge holes, and therefore, has the effect of achieving a further reduction in potential discharge of oil.

[0061] Finally, according to the present invention, refrigerant gas to be discharged is guided to be whirled in the same direction as a rotating direction of a rotor by whirling blades. This has the effect of ensuring more efficient flow of the refrigerant gas to be discharged.

[0062] Although embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be made in this embodiment without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

What is claimed is:

1. A rotary compressor comprising a hermetic container, and a drive device and a compression device mounted in the hermetic container, the hermetic container having an upper cover formed with a gas discharge port, the rotary compressor further comprising:

a scroll chamber defined in an inner surface of the upper cover around the discharge port, to separate oil from gas to be discharged; and

a discharge guiding member installed inside the upper cover, to guide the gas, discharged from the hermetic container, into the scroll chamber and to guide the gas, having passed through the scroll chamber, to the discharge port.

2. The rotary compressor according to claim **1**, wherein the scroll chamber is opened downwardly and comprises an inner curved surface upwardly recessed from the inner surface of the upper cover, the scroll chamber being circularly disposed around the discharge port.

3. The rotary compressor according to claim **2**, wherein the discharge guiding member comprises:

a circular plate portion installed below the discharge port so as to be spaced apart from the inner surface of the upper cover, an outer diameter of the circular plate portion being determined such that a rim of the circular plate portion is located close to the scroll chamber; and

a protrusion portion protruding from an upper surface of the circular plate portion toward the discharge port, to guide discharge of the gas.

4. The rotary compressor according to claim **3**, further comprising:

a discharge flow path provided between the upper cover and the discharge guiding member to guide the gas from the scroll chamber to the discharge port, the discharge flow path having an U-shaped oil trap for separation of the oil from the gas; and

an oil discharge hole formed in the discharge guiding member to discharge the oil gathered in a bottom region of the U-shaped oil trap.

5. The rotary compressor according to claim **4**, wherein the upper cover comprises a bell-mouse shaped inner surface forming a top surface of the discharge flow path, and the protrusion portion comprises a conical outer surface spaced apart from the bell-mouse shaped inner surface, the conical outer surface forming a bottom surface of the discharge flow path.

6. The rotary compressor according to claim **5**, wherein the conical outer surface of the protrusion portion and the upper surface of the circular plate portion form a continuous curved surface together.

7. The rotary compressor according to claim **5**, wherein the upper surface of the circular plate portion comprises an U-shaped curved surface forming a bottom surface of the U-shaped oil trap, the U-shaped curved surface and the conical outer surface of the protrusion portion forming a continuous curved surface together.

8. The rotary compressor according to claim **5**, further comprising:

a first raised oil-shield portion taking the form of a stepped portion provided at a boundary between the bell-mouse shaped inner surface of the upper cover and the scroll chamber and a second raised oil-shield portion taking the form of a convex curved portion provided on the rim of the circular plate portion, for separating the oil from the gas being introduced into the discharge flow path.

9. The rotary compressor according to claim **8**, wherein the discharge port is provided at the center of the upper cover, and

centers of the discharge port, the scroll chamber, and the discharge guiding member coincide with one another.

10. The rotary compressor according to claim **3**, wherein at least one whirling blade is formed at an outer surface of the protrusion portion, to whirl the gas flowing to the discharge port.

11. The rotary compressor according to claim **3**, wherein an inclined guiding surface is provided at the rim of the circular plate portion, to guide the rising gas from the interior of the hermetic container into the scroll chamber.

12. The rotary compressor according to claim **3**, further comprising:

a spacer member interposed between the discharge guiding member and the inner surface of the upper cover; and

a fastening member to secure the discharge guiding member to the upper cover.

13. The rotary compressor according to claim **4**, wherein the drive device comprises a stator secured to an inner surface of the hermetic container and a rotor rotatably installed inside the stator, and

the oil discharge hole is inclined toward the center of the rotor.

14. A rotary compressor, comprising:

a hermetic container having an upper cover formed with a gas discharge port;

a drive device and a compression device mounted in the hermetic container;
an oil collecting device to separate oil from gas to be discharged,
wherein the oil collecting device comprises:
a scroll chamber formed as an inner curved surface upwardly recessed from the inner surface of the upper cover and circularly disposed around the gas discharge port,
a discharge guiding member to guide the gas discharged from the hermetic container into the scroll chamber.

15. The rotary compressor according to claim **14**, wherein the discharge guiding member comprises:
a circular plate portion installed below the discharge port and spaced apart from the inner surface of the upper cover; and
a protrusion portion protruding from an upper surface of the circular plate portion toward the discharge port, to guide discharge of the gas.

16. The rotary compressor according to claim **15**, further comprising:
a U-shaped oil trap for separation of the oil positioned between the upper cover and the discharge guiding member; and
an oil discharge hole formed in the discharge guiding member to discharge the oil gathered in a bottom region of the U-shaped oil trap.

17. The rotary compressor according to claim **15**, further comprising:
a first raised oil-shield portion formed as a stepped portion in the inner surface of the upper cover; and
a second raised oil-shield portion formed as a convex curved portion provided on the rim of the circular plate portion.

18. The rotary compressor according to claim **15**, further comprising at least one whirling blade formed at an outer surface of the protrusion portion.

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