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(54) **Heat source unit installed into ceiling and air conditioner**

Wärmequelleneinheit, die in die Decke installiert ist, und Klimaanlage

Unité de source de chaleur installée sur un plafond et climatiseur

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(73) Proprietor: **Johnson Controls-Hitachi Air Conditioning Technology (Hong Kong) Limited**
Hong Kong (CN)

(72) Inventors:
- **Nagahashi, Katsuaki**
  Shizuoka-shi
  Shizuoka (JP)
- **Sato, Ryoji**
  Shizuoka-shi
  Shizuoka (JP)
- **Kishitani, Tetsushi**
  Shizuoka-shi
  Shizuoka (JP)
- **Endo, Michiko**
  Shizuoka-shi
  Shizuoka (JP)
- **Kosugi, Shinichi**
  Shizuoka-shi
  Shizuoka (JP)

(74) Representative: **Beetz & Partner mbB**
Patentanwälte
Steinsdorfstraße 10
80538 München (DE)

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Description

Field of the Invention

[0001] The present invention relates to a heat source unit installed into a ceiling and an air conditioner, and more particularly, to a technology for facilitating the maintenance of a fan assembly including a fan motor and a blowing fan of a heat source unit installed into a ceiling.

[0002] A heat source as described in the preamble portion of patent claim 1 is known from JP 2005 133969 A.

Description of the Related Art

[0003] Recently, in order to preserve the scenic beauty of the street having a historical scenery in a historical street (for example, Kyoto), the government establishes laws related to the regulation of the building height, the prohibition of the electric advertising displays, and the like. From this viewpoint, it is desirable to hide an outdoor unit of an air conditioner so as not to be noticeable.

[0004] Therefore, the outdoor unit installed on the outside of a building is installed into a ceiling of the building so as to be hidden therein and not to be noticeable from the outside of the building. In this kind of the heat source unit installed into a ceiling, it is required to facilitate the maintenance of components constituting the heat source unit, that is, particularly a component such as a fan assembly including a blowing fan and a fan motor driving the blowing fan.

[0005] That is, since it is troublesome to detach the heat source unit, installed into a ceiling, for the maintenance of the component, it is desirable to carry out the maintenance in such a manner that only the target component is extracted for the maintenance and after the maintenance, it is returned to its original position while the heat source unit itself is installed in the ceiling. However, since the type or size of a space in the ceiling is different for each building and the space in the ceiling is narrow in some buildings, a space used for a series of operations of extracting and returning the target component may not be ensured in some cases.

[0006] In detail, when the height dimension in the ceiling is small, a top surface of a housing may not be detached for an operation of extracting and returning the target component. In addition, in the case where a side surface of the housing is provided with an air inlet and an air outlet for a heat exchange, since an air inlet duct or an air outlet duct is mounted to the side surface provided with the air inlet and the air outlet, it is difficult to extract and return the target component via this side surface.

[0007] Although it may be supposed that the air inlet and the air outlet are provided in the same side surface of the housing, it is difficult to extract and return the target component via the left and right side surfaces of the housing in the case that plural heat source units are continuously installed side by side.

[0008] For this reason, JP-A-2005-133969 discloses a technology in which a mounting member fixed with a blowing fan and a motor driving the blowing fan is mounted to a mounting plate vertically installed in a housing and moves in a sliding manner in a downward direction of an air conditioner body. According to this technology, it is described that the maintenance of the driving motor is easily carried out just by extracting the mounting member in a downward direction of the air conditioner body.

[0009] JP 2005 133969 discloses a heat source unit installed into a ceiling comprising a rectangular housing; an air inlet and an air outlet which are provided on the same side surface of the housing or respectively provided on side surfaces not opposed to each other; a fan assembly which includes a centrifugal fan disposed in the housing and a fan motor driving the centrifugal fan; a heat exchanger which performs a heat exchange using air sucked from the air inlet; and a compressor.

[0010] However, the technology disclosed in JP-A-2005-133969 may not be suitable for the maintenance of the fan assembly of the heat source unit installed into a ceiling of a building.

[0011] That is, when the ceiling provided with the heat source unit is made of concrete in some buildings, it is difficult to form an opening which is used to extract and return the fan assembly.

[0012] In addition, since the heat source unit is provided with heavy components such as a fan assembly, a compressor, and a heat exchanger, the heat source unit may weigh 100 kg or more in accordance with its type. Accordingly, the housing's bottom surface supporting the heavy components is required to have the sufficient strength. However, when the bottom surface of the housing is provided with the opening used to extract and return the fan assembly, the strength of the housing reduces. Accordingly, it is not desirable to form the opening in the bottom surface.

Brief Summary of the Invention

[0013] Therefore, an object of the invention is to provide a heat source unit installed into a ceiling capable of facilitating the maintenance of a fan assembly even in a ceiling having a limited space. The above problem is solved by a heat source unit provided with the features of claim 1. Preferred embodiments are defined in the dependent claims.

[0014] According to an aspect of the invention, there is provided a heat source unit installed into a ceiling including: a rectangular housing; an air inlet and an air outlet which are provided on the same side surface of the housing or respectively provided on side surfaces not opposed to each other; a fan assembly which includes a centrifugal fan disposed in the housing and a fan motor driving the centrifugal fan; a heat exchanger which performs a heat exchange using air sucked from the air inlet; and a compressor, and the heat source unit is disposed into the ceiling of a building.

[0015] In particular, on a side surface opposed to the side surface on which the air inlet of the housing is provided is provided an openable extraction port which is used to extract the fan assembly and a slide mechanism which is used to slide the fan assembly to the outside of the housing via the extraction port.

[0016] That is, in the heat source unit having the above-described configuration, assuming that the side surface on which the air inlet of the housing is provided is set to the front side surface, the extraction port configured to be openable for the maintenance is provided on the rear side surface opposed to the front side surface, and the fan assembly is moved to the outside in a sliding manner via the extraction port so as to carry out the maintenance.

[0017] With such a configuration, even when the maintenance space is not ensured on the top surface and the bottom surface sides of the housing in the heat source unit, the air inlet and the air outlet are provided on, for example, the same side surface, and the left and right side surfaces of the heat source unit are continuously disposed so as to be opposed to each other, it is possible to detach the fan assembly in a sliding manner from the rear side surface. Accordingly, it is not necessary to detach from the ceiling the heat source unit installed into the ceiling. Also, even when the ceiling floor surface provided with the heat source unit is formed into a concrete surface or the like, it is possible to easily carry out the maintenance of the fan assembly.

[0018] In the heat source unit having the above-described configuration, the slide mechanism may include a pair of guide rails which extends in parallel in the housing in a direction perpendicular to the side surface on which the air inlet of the housing is provided, and a mounting member which is guided by the guide rails to move in a sliding manner and to which the fan assembly is fixed.

[0019] In the heat source unit having the above-described configuration, it is preferred that the fan assembly is disposed in the housing so that a rotation shaft of the centrifugal fan is disposed in a direction perpendicular to the side surface on which the air inlet of the housing is provided, and is extracted to the outside of the housing in a sliding manner in a direction along the rotation shaft of the centrifugal fan. Particularly, the heat source unit having the above-described configuration is desirable in the case where the fan assembly includes at least two or more sirocco fans which are arranged in series on the same rotation shaft and a fan motor which drives the sirocco fans.

[0020] That is, in the case where two or more sirocco fans are arranged in series on the same rotation shaft, when the maintenance of the fan assembly is carried out in the state that the rear side surface of the housing is detached, the maintenance of the sirocco fan or the fan motor on the operator side may be carried out, but the maintenance of the sirocco fan or the fan motor on the inmost side cannot be carried out. Accordingly, in this case, particularly, it is desirable to extract the fan assembly in a sliding manner from the housing in a direction along the rotation shaft.

[0021] In the heat source unit having the above-described configuration, when an opening may be provided at a position corresponding to an air outlet of the fan assembly, and a separation plate, which separates an air intake passageway used for air sucked from the air inlet of the housing from an air outlet passageway used for air discharged from the air outlet of the fan assembly, may be disposed in a manner perpendicular to the side surface on which the air inlet of the housing is provided, the slide mechanism may include a pair of guide rails which is provided on a surface of the separation plate on the side of the air intake passageway so as to extend in parallel in the housing in a direction perpendicular to the side surface on which the air inlet of the housing is provided, and a mounting member which is guided by the guide rails to move in a sliding manner and to which the fan assembly is fixed.

[0022] In the heat source unit having the above-described configuration, it is preferred that the mounting member to which the fan assembly is fixed is formed detachably from the separation plate provided with the guide rails. In the case that the maintenance of the fan assembly can be carried out in the state that the fan assembly is extracted to the outside in a sliding manner, the maintenance thereof is carried out in such the above state, and after the maintenance ends, the fan assembly is returned to its original position in a sliding manner. On the other hand, in the case that the maintenance cannot be carried out in the ceiling, the fan assembly is extracted from the housing in a sliding manner, and then the mounting member is detached from the separation plate. After the maintenance ends, the mounting member is mounted to the separation plate again and is returned to its original position in a sliding manner.

[0023] According to another aspect of the invention, there is provided an air conditioner including: the heat source unit having any one of the above-described configurations; and an indoor unit which includes an expansion valve and a heat exchanger for indoor unit, wherein the heat source unit is connected to the indoor unit by means of piping which circulates a coolant.

[0024] According to the invention, it is possible to provide a heat source unit installed into a ceiling capable of facilitating the maintenance of a fan assembly even in a ceiling having a limited space.

Brief Description of Several Views of Drawing

[0025]

Fig. 1 is a perspective view showing a heat source unit installed into a ceiling according to an embodiment in a state where an upper cover is detached from the heat source unit.

Fig. 2 is a top view showing the heat source unit according to this embodiment.

Fig. 3 is a vertical sectional view showing the heat

source unit according to this embodiment when viewed from a front side thereof.

Fig. 4 is a vertical sectional view showing the heat source unit according to this embodiment when viewed from a side thereof.

Fig. 5 is a perspective view showing a relationship of a separation plate, a mounting plate, and a fan assembly.

Fig. 6 is a perspective view showing a fixed structure between the mounting member and the separation plate.

Detailed Description of the Invention

[0026] Hereinafter, a heat source unit installed into a ceiling according to an embodiment of the invention will be described. In addition, in the following description, the same reference numerals will be given to the same components and the repetitive description thereof will be omitted.

[0027] The heat source unit according to this embodiment is a heat source unit which is installed into a ceiling of a building for various demands need to be handled, for example, in the cases that the scenic beauty of the street needs to be preserved, the installation space cannot be ensured in outdoor, or the like.

[0028] Figs. 1 to 4 are views showing the heat source unit installed into a ceiling according to the invention. Fig. 1 is a perspective view showing the heat source unit in the state where an upper cover is detached from a housing. Fig. 2 is a top view. Fig. 3 is a vertical sectional view when viewed from the front side thereof. Fig. 4 is a vertical sectional view when viewed from the side thereof.

[0029] In addition, in this embodiment, a side surface, on which an air inlet and an air outlet are provided, among side surfaces of the housing of the heat source unit will be described as the front side surface. In the perspective view of Fig. 1, an air inlet duct and an air outlet duct are omitted.

[0030] As shown in Figs. 1 to 4, a heat source unit 10 according to this embodiment is configured to arrange in a rectangular housing 12, a compressor 14 which compresses a coolant; a heat exchanger 16 which performs a heat exchange between the coolant and air; a fan assembly 18 which sucks air from the outside so as to use the air for a heat exchange using the heat exchanger 16 and discharges the air to the outside after using the air for the heat exchange; and an electrical box 20 which accommodates electrical components such as a control circuit board.

[0031] The housing is provided with an air inlet 24 and an air outlet 26 on a front side surface 22. The air inlet 24 and the air outlet 26 are respectively provided with an air inlet duct 25 and an air outlet duct 27 so as to communicate with the external air of the building.

[0032] The fan assembly 18 includes two sirocco fans (centrifugal fans) 28 which are arranged in series on the same rotation shaft and a fan motor 30 which drives the sirocco fans 28. The sirocco fans 28 are accommodated in a fan casing 31. The fan assembly 18 is disposed at the substantially center in the housing so that the rotation shaft of the sirocco fans 28 is perpendicular to the front side surface 22 on which the air inlet 24 is provided (in a direction along left and right side surfaces 32 and 34 of the housing). In other words, the rotation shaft of the sirocco fans 28 is disposed in the same direction as an air intake direction from the air inlet 24.

[0033] The heat exchanger 16 is disposed on the air inlet side of the fan assembly 18 so as to have a substantially L-shaped section in a horizontal direction, where the L-shaped section surrounds the fan assembly 18. The compressor 14 is disposed between the heat exchanger 16 and the right side surface 34. The electrical box 20 is disposed adjacent to a rear side surface 36 on the air outlet side of the fan assembly 18. The compressor 14, the heat exchanger 16, the electrical box 20, and the like can be arbitrarily fixed to a bottom surface 37 of the housing.

[0034] In the housing, a separation plate 38 provided with an opening formed at a position corresponding to an air outlet of the fan assembly 18 separates an air intake passageway 40 which is used for the air sucked from the air inlet 24 of the housing from an air outlet passageway 42 which is used for the air discharged from the air outlet of the fan assembly 18 so as to communicate with the air outlet 26 of the housing. The separation plate 38 is disposed so as to be perpendicular to the front side surface 22 of the housing. In addition, on a surface of the separation plate 38 on the side of the air intake passageway 40 is provided a mounting member 43 to which the fan assembly 18 is fixed. The relationship of the separation plate 38, the mounting member 43, and the fan assembly 18 will be described later in detail.

[0035] The heat source unit 10 is suspended from an upper surface 48 in the ceiling of the building by means of four suspension bars 46 which are respectively fixed to metallic suspension members 44 provided at four corners of the housing. However, instead of the suspension, in the case where a lower surface 50 in the ceiling of the building is formed into a concrete floor surface or the like, the heat source unit 10 may be directly installed on the floor surface.

[0036] Next, an air stream with an operation of driving the fan assembly 18 of the heat source unit according to this embodiment will be described. When the sirocco fans 28 are rotated by the driving operation of the fan motor 30, air is sucked from the outside of the building via the air intake duct 25 (air stream 52), and is introduced into the air intake passageway 40 via the air intake 24 formed on the front side surface of the housing.

[0037] Subsequently, a heat exchange is carried out between the air and the coolant flowing through the inside of the heat exchanger 16, and then, the air is discharged to the air outlet passageway 42 via the air outlet of the fan assembly 18. The discharged air is curved toward the air outlet 26 by a wall surface of the left side surface

32 of the housing, and the air is discharged from the air outlet 26 to the outside of the building via the air outlet duct 27 (air stream 54).

[0038] Likewise, when the air outlet direction of the fan assembly 18 is arranged perpendicular to the air outlet 26 formed on the front side surface of the housing, the blowing sound is not directly audible. Accordingly, a sound insulation advantage can be expected.

[0039] In addition, in order to ensure an absorption surface as much as possible within the limited dimension of a product, the heat exchanger 16 is formed to have a substantially L-shaped section provided with one curved portion in a horizontal direction, and the short side of the L-shaped section is disposed on the side of the air inlet 24 of the housing. Accordingly, an air-conditioning ability is improved by increasing a heat transmission area of the heat exchanger 16, and a ventilation resistance is reduced. As a result, it is possible to reduce the rotation number of the sirocco fans 28 generating the same amount of wind, and thus to reduce the noise or consumption power. Likewise, the heat source unit according to this embodiment is best suited to realize the noise reduction, the energy saving, and the compact in size.

[0040] Meanwhile, in the heat source unit installed into a ceiling according to this embodiment, the maintenance has to be easily carried out in the components constituting the heat source unit, that is, particularly in the components such as the fan assembly 18 which includes a driving portion and is frequently exchanged or repaired due to its lifetime.

[0041] That is, since it is troublesome to detach the heat source unit installed into a ceiling, for the maintenance of the components, it is desirable to carry out the maintenance in such a manner that only the target component is extracted for the maintenance and after the maintenance ends, is returned to its original position while the heat source unit itself is installed into the ceiling.

[0042] Meanwhile, as shown in Figs. 3 and 4, in some buildings, it is not possible to detach the upper surface (top surface) 56 from the housing and extract the fan assembly 18 from the housing due to the relationship of the dimension between the upper surface 48 and the lower surface 50 of the ceiling and the height dimension of the housing. Particularly, when the lower surface 50 is formed into a concrete surface, the fan assembly 18 may not slide in a downward direction of the housing as in the same case of the related art.

[0043] In addition, in the case where plural heat source units are installed, the left and right side surfaces 32 and 34 of the housing may be installed adjacent to each other. Accordingly, in some cases, the maintenance space may not be ensured in a transverse direction of the housing.

[0044] For this reason, in the heat source unit according to this embodiment, in order to easily carry out the maintenance of the fan assembly 18 even in the case of the above-described limitation, on the rear side surface 36 opposed to the front side surface 22 of the housing is provided an openable extraction port which is used to extract the fan assembly 18, and a slide mechanism which is used to slide the fan assembly 18 to the outside of the housing via the extraction port. In the extraction port, a portion of the rear side surface 36 corresponding to at least the fan assembly 18 is detachable or formed in a door shape so as to be opened.

[0045] Regarding the slide mechanism, in detail, on the surface of the separation plate 38 on the side of the air intake passageway 40 is provided a pair of guide rails 58 which extends in parallel in a direction perpendicular to the front side surface 22 of the housing, as shown in Fig. 5. In other words, the guide rails 58 extend in parallel to a direction along the rotation shaft of the sirocco fans 28. In addition, the mounting member 43 is guided by the pair of guide rails 58 in a sliding manner, and the fan casing 31 of the fan assembly 18 is fixes to the mounting member.

[0046] That is, the slide mechanism is configured to move the fan assembly 18 to the outside of the housing in a sliding manner via the extraction port formed on the rear side surface of the housing by means of the mounting member 43 and the pair of guide rails 58.

[0047] Accordingly, when the maintenance of the fan assembly 18 is carried out, for example, the detachable rear side surface 36 of the housing is detached so as to open the extraction port, and the mounting member 43 or the fan assembly 18 is extracted to the outside in a sliding manner. Subsequently, the maintenance of the extracted fan assembly 18 is carried out while keeping the extracted state, the extracted fan assembly 18 is returned to its original position in a sliding manner after the maintenance is carried out, and then the rear side surface 36 is attached to its original position, thereby ending the maintenance procedure.

[0048] In addition, in the case that the mounting member 43 is detachably mounted to the separation plate 38, after the mounting member 43 is extracted to the outside in a sliding manner, the mounting member 43 is detached from the separation plate 38. Subsequently, the maintenance of the fan assembly is carried out in other places, and then, the mounting member 43 is mounted to the separation plate 38 again and is returned to its original position.

[0049] The mounting member 43 is fixed to the separation plate 38 by means of a screw or the like at the position on the side of the rear side surface 36 of the housing. In case of the fixing operation on the side of the front side surface 22 of the housing, it is difficult to fasten or unfasten a screw. For this reason, on a portion of the separation plate 38 on the side of the front side surface 22 of the housing is provided a claw 60 which engages with the mounting member 43. Also, on the mounting member 43 is provided a notch 62 which engages with the claw 60.

[0050] With such a configuration, the claw 60 serves as a stopper during the sliding operation. In addition, the separation plate 38 serves as a reinforcing member which reinforces the upper surface 56 or the bottom sur-

face 37 of the housing, and the guide rail 58 itself serves as a reinforcing member which reinforces the separation plate 38 or the mounting member 43 supported thereto. Accordingly, it is advantageous to improve the strength or to reduce the vibration.

[0051] As described above, in the heat source unit according to this embodiment, it is possible to extract the fan assembly from the rear side surface of the housing in a sliding manner. Accordingly, it is not necessary to detach the heat source unit from the ceiling. Also, even when the ceiling floor surface provided with the heat source unit is formed into the concrete surface or the like, it is possible to easily carry out the maintenance of the fan assembly.

[0052] In the case where the fan assembly 18 is fixed to the inside of the housing, it is not possible to touch with a hand one of the sirocco fans 28 or the fan motor 30 disposed on the inside of the rear side surface 36 of the housing. For this reason, according to this embodiment, since it is possible to detach or attach the mounting member 43 from or to the heat source unit upon checking or exchanging the fan assembly 18, it is possible to easily carry out the maintenance.

[0053] Since the electrical box 20, the compressor 14, and the like of which the maintenance is highly frequently carried out are disposed so that the access can be made via the rear side surface of the housing, the maintenance space being reliably ensured on the rear side surface, it is possible to simply carry out the maintenance just by detaching the rear side surface.

[0054] In addition, in this embodiment, there is described an example in which the fan assembly is disposed so that the rotation shaft of the sirocco fans 28 is disposed in a direction along the left and right side surfaces of the housing. However, the invention is not limited thereto, and the fan assembly may be disposed in an arbitrary direction. That is, even in the heat source unit installed into a ceiling, the fan assembly may be configured to be extracted from the rear side surface of the housing in a sliding manner, where the maintenance space is not limited in the rear side surface.

[0055] Further, in this embodiment, there is described an example in which the separation plate is provided with the guide rail. However, the invention is not limited thereto, and the guide rail may be formed at an arbitrary position (for example, the bottom surface of the housing) in the housing. That is, the guide rail may be formed so that the fan assembly is extracted from the rear side surface of the housing in a sliding manner.

[0056] Furthermore, in this embodiment, there is described an example in which on the same side surface of the housing is provided the air inlet and the air outlet. However, the invention is not limited thereto, and the air inlet and the air outlet may be respectively formed on the side surfaces which are not opposed to each other. That is, on condition of setting the side surface on which the air inlet is provided to the front side surface, even in the heat source unit installed into a ceiling, the fan assembly may be configured to be extracted in a sliding manner from the rear side surface where the maintenance space is not limited.

Claims

1. A heat source unit installed into a ceiling comprising:

   a rectangular housing (12);
   an air inlet (24) and an air outlet (26) which are provided on the same side surface of the housing (12) or respectively provided on side surfaces not opposed to each other;
   a fan assembly (18) which includes a centrifugal fan (28) disposed in the housing (12) and a fan motor (30) driving the centrifugal fan (28);
   a slide mechanism which is used to slide said fan assembly (18) to the outside of the housing (12);
   a heat exchanger (16) which performs a heat exchange using air sucked from the air inlet (24);
   characterized in that the heat source unit further comprises a compressor (14) and that on a side surface (36) opposed to the side surface (22) on which the air inlet (24) of the housing (12) is provided there is provided an openable extraction port which is used to extract the fan assembly (18) and said slide mechanism which is used to slide the fan assembly (18) to the outside of the housing (12) via the extraction port.

2. The heat source unit according to Claim 1, wherein the slide mechanism includes a pair of guide rails (58) which extend in parallel in the housing (12) in a direction perpendicular to the side surface (22) on which the air inlet (24) of the housing (12) is provided and a mounting member (43) which is guided by the guide rails (58) in a sliding manner and to which the fan assembly (18) is fixed.

3. The heat source unit according to Claim 1, wherein the fan assembly (18) is disposed in the housing (12) so that a rotation shaft of the centrifugal fan (28) is disposed in a direction perpendicular to the side surface (22) on which the air inlet (24) of the housing (12) is provided, and the fan assembly (18) is extracted to the outside of the housing (12) in a sliding manner in a direction along the rotation shaft of the centrifugal fan (28).

4. The heat source unit according to Claim 1, wherein an opening is provided at a position corresponding to an air outlet (26) of the fan assembly (18), and a separation plate (38), which separates an air intake passageway used for air sucked from the air inlet (24) of the housing (12) from an air outlet passageway used for air discharged from the air outlet (26)

of the fan assembly (18), is disposed in a direction perpendicular to the side surface (22) the air inlet (24) of the housing (12) is provided, and
wherein the slide mechanism includes a pair of guide rails (58) which are provided on a surface of the separation plate (38) on the side of the air intake passageway so as to extend in parallel in the housing (12) in a direction perpendicular to the side surface (22) on which the air inlet (24) of the housing (12) is provided and a mounting member (43) which is guided by the guide rails (58) in a sliding manner and to which the fan assembly (18) is fixed.

5. The heat source unit according to Claim 4, wherein the mounting member (43) to which the fan assembly (18) is fixed is detachably provided on the separation plate (38) on which the guide rails (58) are provided.

6. The heat source unit according to Claim 4, wherein on the separation plate (38) on the side of the air inlet (24) of the housing (12) there is provided a claw (60) which engages with the mounting member (43) and the mounting member (43) is provided with a notch which engages with the claw (60).

7. The heat source unit according to Claim 1, wherein the heat exchanger (16) is disposed on the air intake side of the fan assembly (18) so as to surround sides except for a side positioned in the slide direction of the fan assembly (18).

8. The heat source unit according to Claim 1, wherein the fan assembly (18) includes two or more sirocco fans (28) which are arranged in series on the same rotation shaft and a fan motor (30) which drives the sirocco fans (28).

9. An air conditioner comprising:

the heat source unit according to any one of Claims 1 to 8; and
an indoor unit which includes an expansion valve and a heat exchanger for indoor unit,
wherein the heat source unit is connected to the indoor unit by means of piping which circulates a coolant.

Patentansprüche

1. Wärmequelleneinheit, welche in eine Decke eingebaut ist, mit:

einem rechteckigen Gehäuse (12),
einem Lufteinlass (24) und einem Luftauslass (26), die auf derselben Seitenfläche des Gehäuses (12) oder jeweils auf Seitenflächen, die sich nicht gegenüberliegen, angeordnet sind,
einer Ventilatoranordnung (18), die einen Zentrifugalventilator (28) umfasst, der in dem Gehäuse (12) angeordnet ist, und einen Ventilatormotor (30), der den Zentrifugalventilator (28) antreibt,
einen Gleitmechanismus, der dazu verwendet wird, die Ventilatoranordnung (18) aus dem Gehäuse (12) herausgleiten zu lassen,
einem Wärmetauscher (16), der einen Wärmeaustausch ausführt, indem er von dem Lufteinlass (24) angesaugte Luft verwendet,

dadurch gekennzeichnet, dass die Wärmequelleneinheit ferner einen Kompressor (14) aufweist, und dadurch, dass auf einer Seitenfläche (36) gegenüber der Seitenfläche (22), auf der der Lufteinlass (24) des Gehäuses (12) angeordnet ist, eine Herausziehluke, die sich öffnen lässt, vorgesehen ist, die verwendet wird, um die Ventilatoranordnung (18) und den Gleitmechanismus herauszuziehen, der verwendet wird, um die Ventilatoranordnung (18) durch die Herausziehluke aus dem Gehäuse herausgleiten zu lassen.

2. Wärmequelleneinheit nach Anspruch 1,
wobei der Gleitmechanismus ein Paar Gleitschienen (58) umfasst, die sich parallel in dem Gehäuse (12) in einer Richtung senkrecht zu der Seitenfläche (22) erstrecken, auf der der Lufteinlass (24) des Gehäuses (12) angeordnet ist, und ein Montageelement (43), welches durch die Führungsschienen (58) gleitend geführt wird und an dem die Ventilatoranordnung (18) befestigt ist.

3. Wärmequelleneinheit nach Anspruch 1,
wobei die Ventilatoranordnung (18) in dem Gehäuse (12) angeordnet ist, sodass eine Rotationswelle des Zentrifugalventilators (12) in einer Richtung senkrecht zu der Seitenfläche (22), auf der der Lufteinlass (24) des Gehäuses (12) vorgesehen ist, angeordnet ist, und wobei die Ventilatoranordnung (18) aus dem Gehäuse (12) gleitend in einer Richtung entlang der Rotationswelle des Zentrifugalventilators (28) herausgezogen wird.

4. Wärmequelleneinheit nach Anspruch 1,
wobei eine Öffnung an einer Stelle vorgesehen ist, die einem Luftauslass (28) der Ventilatoranordnung (18) entspricht, und eine Trennungsplatte (38), die einen Lufteinlassdurchgang, der für die von dem Lufteinlass (24) des Gehäuses (12) angesaugte Luft verwendet wird, von einem Luftauslassdurchgang trennt, der für die von dem Luftauslass (26) der Ventilatoranordnung (18) abgegebene Luft verwendet wird, in einer Richtung senkrecht zu der Seitenfläche (22), auf der der Lufteinlass (24) des Gehäuses (12) vorgesehen ist, angeordnet ist, und
wobei der Gleitmechanismus ein Paar Gleitschienen

(58) umfasst, die auf einer Fläche der Trennungsplatte (38) auf der Seite des Lufteinlassdurchgangs vorgesehen sind, um sich parallel zueinander in dem Gehäuse (12) in einer Richtung senkrecht zu der Seitenfläche (22) zu erstrecken, auf der der Lufteinlass (24) des Gehäuses (12) vorgesehen ist, und ein Montageelement (43), welches von den Führungsschienen (58) gleitend geführt wird und an dem die Ventilatoranordnung (18) befestigt ist.

5. Wärmequelleneinheit nach Anspruch 4, wobei das Montageelement (43), an dem die Ventilatoranordnung (18) befestigt ist, abnehmbar auf der Trennungsplatte (38), auf der die Führungsschienen (58) angeordnet sind, vorgesehen ist.

6. Wärmequelleneinheit nach Anspruch 4, wobei auf der Trennungsplatte (38) auf der Seite des Lufteinlasses (24) des Gehäuses (12) eine Klaue (60) vorgesehen ist, die mit dem Montageelement (43) in Eingriff steht, und wobei das Montageelement (43) mit einer Nut versehen ist, mit der die Klaue (60) in Eingriff steht.

7. Wärmequelleneinheit nach Anspruch 1, wobei der Wärmetauscher (16) auf der Lufteinlassseite der Ventilatoranordnung (18) angeordnet ist, um die Seiten zu umgeben, mit Ausnahme einer Seite, die in der Gleitrichtung der Ventilatoranordnung (18) gelegen ist.

8. Wärmequelleneinheit nach Anspruch 1, wobei die Ventilatoranordnung (18) zwei oder mehr Sirocco-Ventilatoren (28) aufweist, die hintereinander auf derselben Rotationswelle angeordnet sind, und einen Ventilatormotor (30), der die Sirocco-Ventilatoren (28) antreibt.

9. Klimaanlage, die aufweist:

die Wärmequelleneinheit nach einem der Ansprüche 1 bis 8, und
eine Innenraumeinheit, die ein Expansionsventil und einen Wärmetauscher für die Innenraumeinheit aufweist,
wobei die Wärmequelleneinheit mit der Innenraumeinheit durch Leitungen verbunden ist, in denen ein Kühlmittel fließt.

Revendications

1. Unité de source de chaleur installée dans un plafond comprenant :

un logement rectangulaire (12) ;
une entrée d'air (24) et une sortie d'air (26) qui sont prévues sur la même surface latérale du logement (12) ou prévues respectivement sur des surfaces latérales non opposées l'une à l'autre ;
un ensemble de ventilateur (18) qui inclut un ventilateur centrifuge (28) disposé dans le logement (12) et un moteur de ventilateur (30) entraînant le ventilateur centrifuge (28) ;
un mécanisme de coulissement qui est utilisé pour faire coulisser ledit ensemble de ventilateur (18) jusqu'à l'extérieur du logement (12) ;
un échangeur de chaleur (16) qui exécute un échange de chaleur en utilisant de l'air aspiré par l'entrée d'air (24) ;
caractérisée en ce que l'unité de source de chaleur comprend en outre un compresseur (14) et **en ce que** sur une surface latérale (36) opposée à la surface latérale (22) sur laquelle l'entrée d'air (24) du logement (12) est prévue, il est prévu un orifice d'extraction pouvant être ouvert qui est utilisé pour extraire l'ensemble de ventilateur (18) et ledit mécanisme de coulissement qui est utilisé pour faire coulisser l'ensemble de ventilateur (18) jusqu'à l'extérieur du logement (12) par l'orifice d'extraction.

2. Unité de source de chaleur selon la revendication 1, dans laquelle le mécanisme de coulissement inclut une paire de rails de guidage (58) qui s'étendent en parallèle dans le logement (12) dans un sens perpendiculaire à la surface latérale (22) sur laquelle l'entrée d'air (24) du logement (12) est prévue et un élément de montage (43) qui est guidé par les rails de guidage (58) d'une manière coulissante et auquel l'ensemble de ventilateur (18) est fixé.

3. Unité de source de chaleur selon la revendication 1, dans laquelle l'ensemble de ventilateur (18) est disposé dans le logement (12) de telle manière qu'un arbre de rotation du ventilateur centrifuge (28) est disposé dans un sens perpendiculaire à la surface latérale (22) sur laquelle l'entrée d'air (24) du logement (12) est prévue, et l'ensemble de ventilateur (18) est extrait jusqu'à l'extérieur du logement (12) d'une manière coulissante dans un sens le long de l'arbre de rotation du ventilateur centrifuge (28).

4. Unité de source de chaleur selon la revendication 1, dans laquelle une ouverture est prévue en une position correspondant à une sortie d'air (26) de l'ensemble de ventilateur (18), et une plaque de séparation (38), qui sépare un passage d'admission d'air utilisé pour de l'air aspiré depuis l'entrée d'air (24) du logement (12) d'un passage de sortie d'air utilisé pour de l'air évacué de la sortie d'air (26) de l'ensemble de ventilateur (18), est disposée dans un sens perpendiculaire à la surface latérale (22) de l'entrée d'air (24) du logement (12) est prévue, et dans laquelle le mécanisme de coulissement inclut

une paire de rails de guidage (58) qui sont prévus sur une surface de la plaque de séparation (38) sur le côté du passage d'admission d'air de manière à s'étendre en parallèle dans le logement (12) dans un sens perpendiculaire à la surface latérale (22) sur laquelle l'entrée d'air (24) du logement (12) est prévue et un élément de montage (43) qui est guidé par les rails de guidage (58) d'une manière coulissante et auquel l'ensemble de ventilateur (18) est fixé.

5. Unité de source de chaleur selon la revendication 4, dans laquelle l'élément de montage (43) auquel l'ensemble de ventilateur (18) est fixé est prévu détachable sur la plaque de séparation (38) sur laquelle les rails de guidage (58) sont prévus.

6. Unité de source de chaleur selon la revendication 4, dans laquelle, sur la plaque de séparation (38) sur le côté de l'entrée d'air (24) du logement (12), il est prévu une griffe (60) qui s'engage avec l'élément de montage (43) et l'élément de montage (43) est prévu avec une entaille qui s'engage avec la griffe (60).

7. Unité de source de chaleur selon la revendication 1, dans laquelle l'échangeur de chaleur (16) est disposé sur le côté admission d'air de l'ensemble de ventilateur (18) de manière à entourer des côtés à l'exception d'un côté positionné dans le sens de coulissement de l'ensemble de ventilateur (18).

8. Unité de source de chaleur selon la revendication 1, dans laquelle l'ensemble de ventilateur (18) inclut deux ventilateurs sirocco (28) ou plus qui sont agencés en série sur le même arbre de rotation et un moteur de ventilateur (30) qui entraîne les ventilateurs sirocco (28).

9. Climatiseur comprenant :

l'unité de source de chaleur selon l'une quelconque des revendications 1 à 8 ; et
une unité intérieure qui inclut une vanne de détente et un échangeur de chaleur pour unité intérieure,
dans lequel l'unité de source de chaleur est connectée à l'unité intérieure au moyen d'une canalisation qui fait circuler un réfrigérant.

FIG. 1

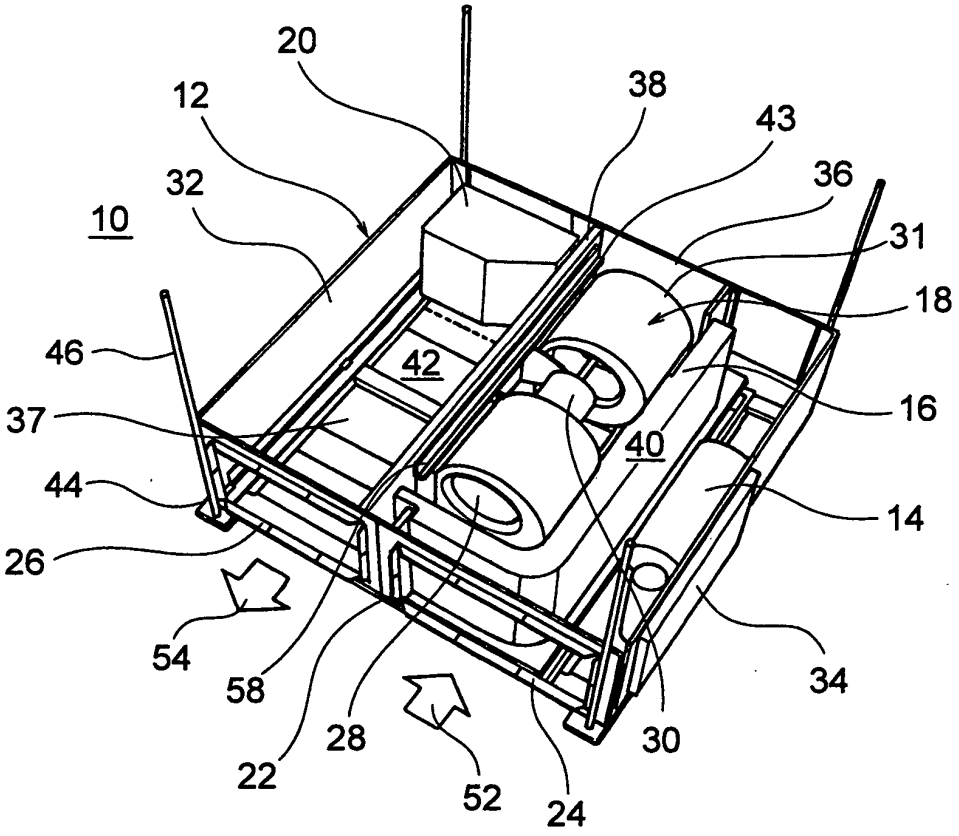
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FIG. 2

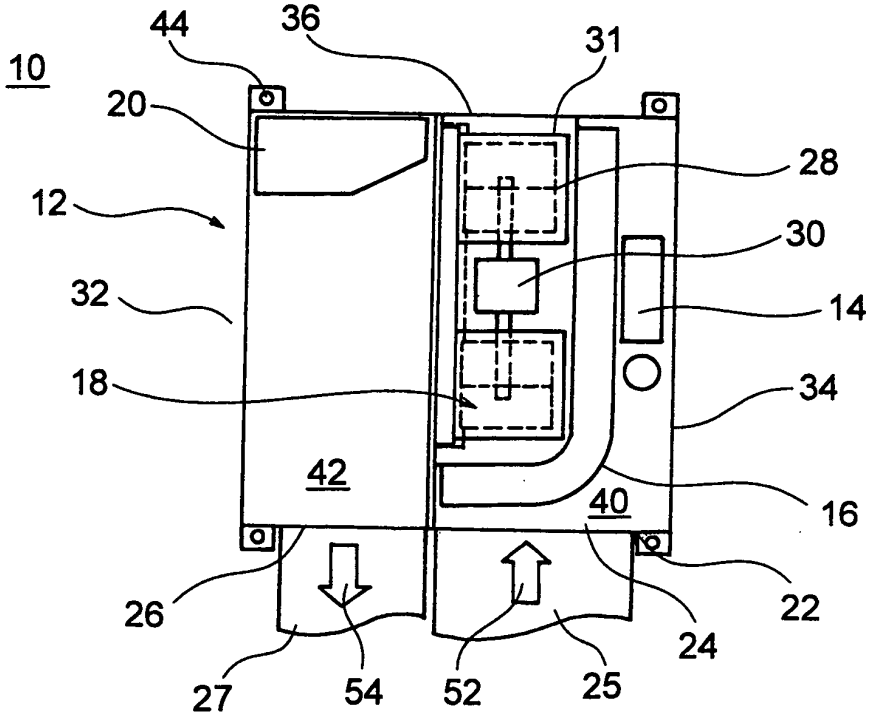
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FIG. 3

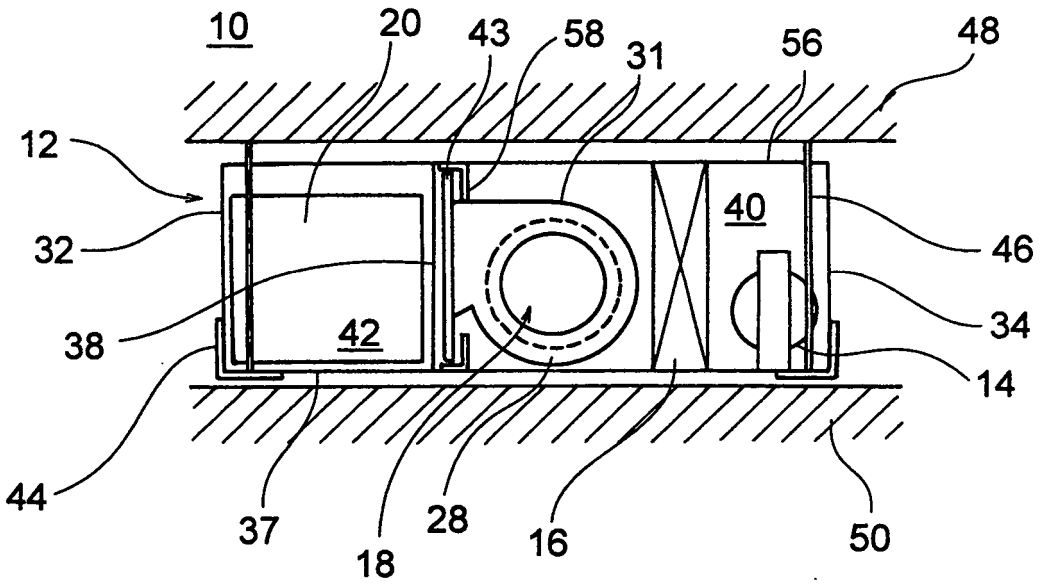
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FIG. 4

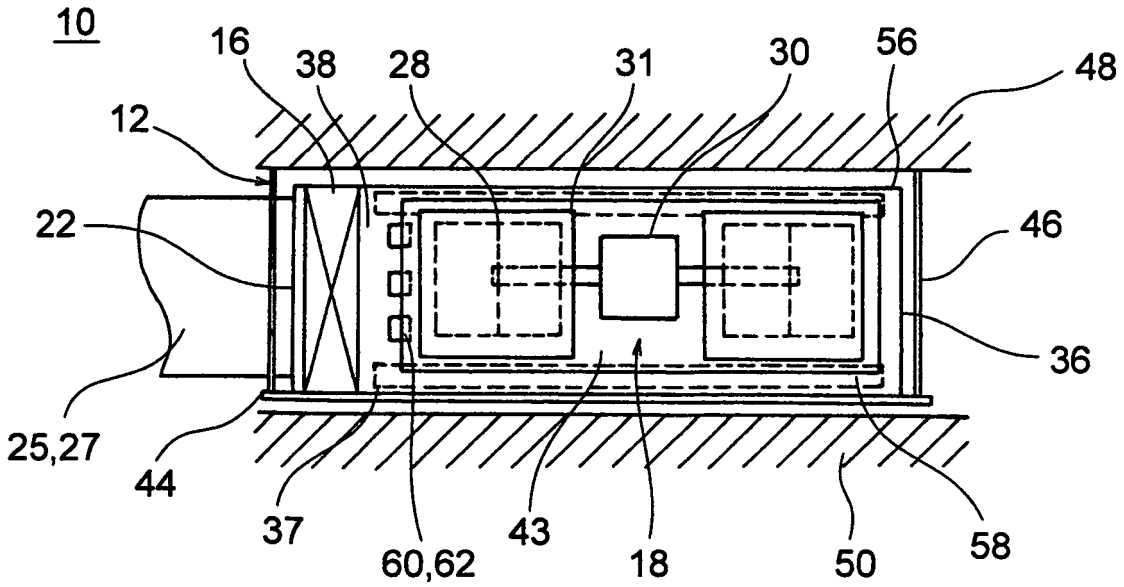
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FIG. 5

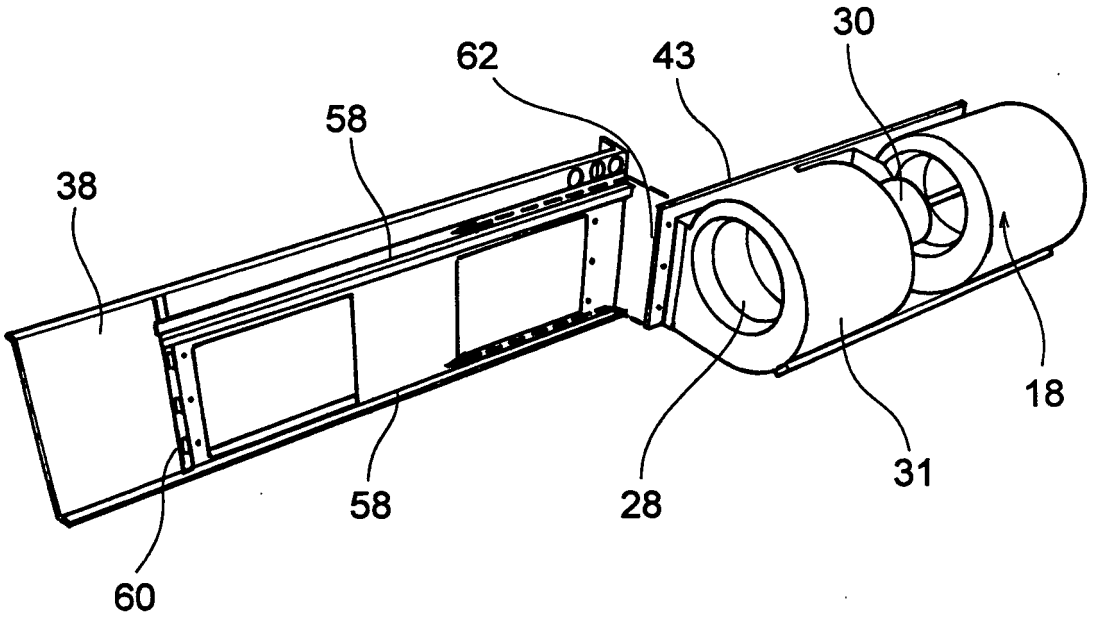
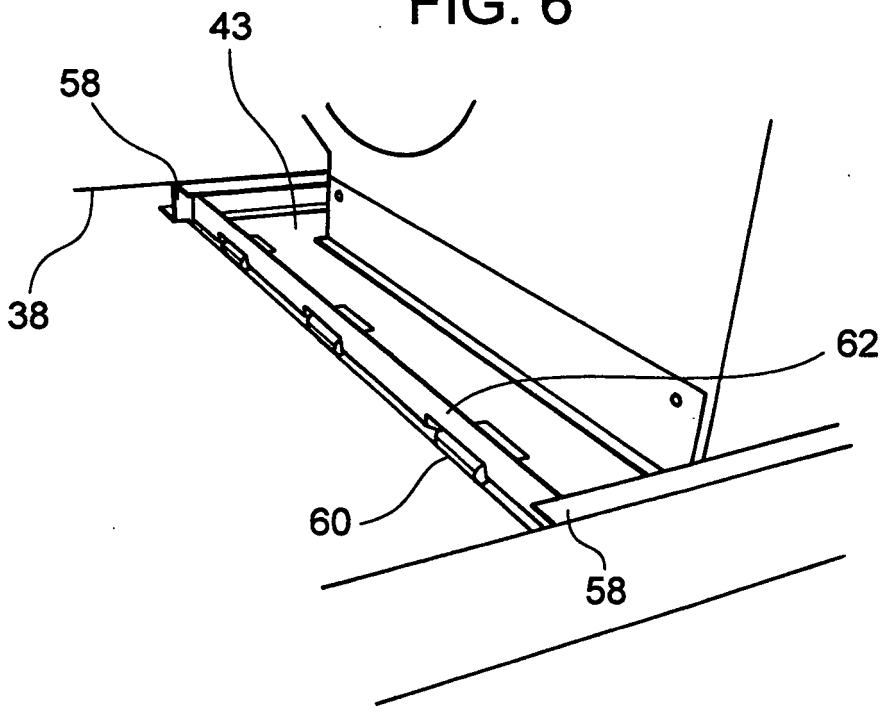


FIG. 6



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