

April 3, 1962

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3,027,736

AIR SEAL FOR ADJUSTABLE MOTOR MOUNT

Filed March 16, 1961

3 Sheets-Sheet 3

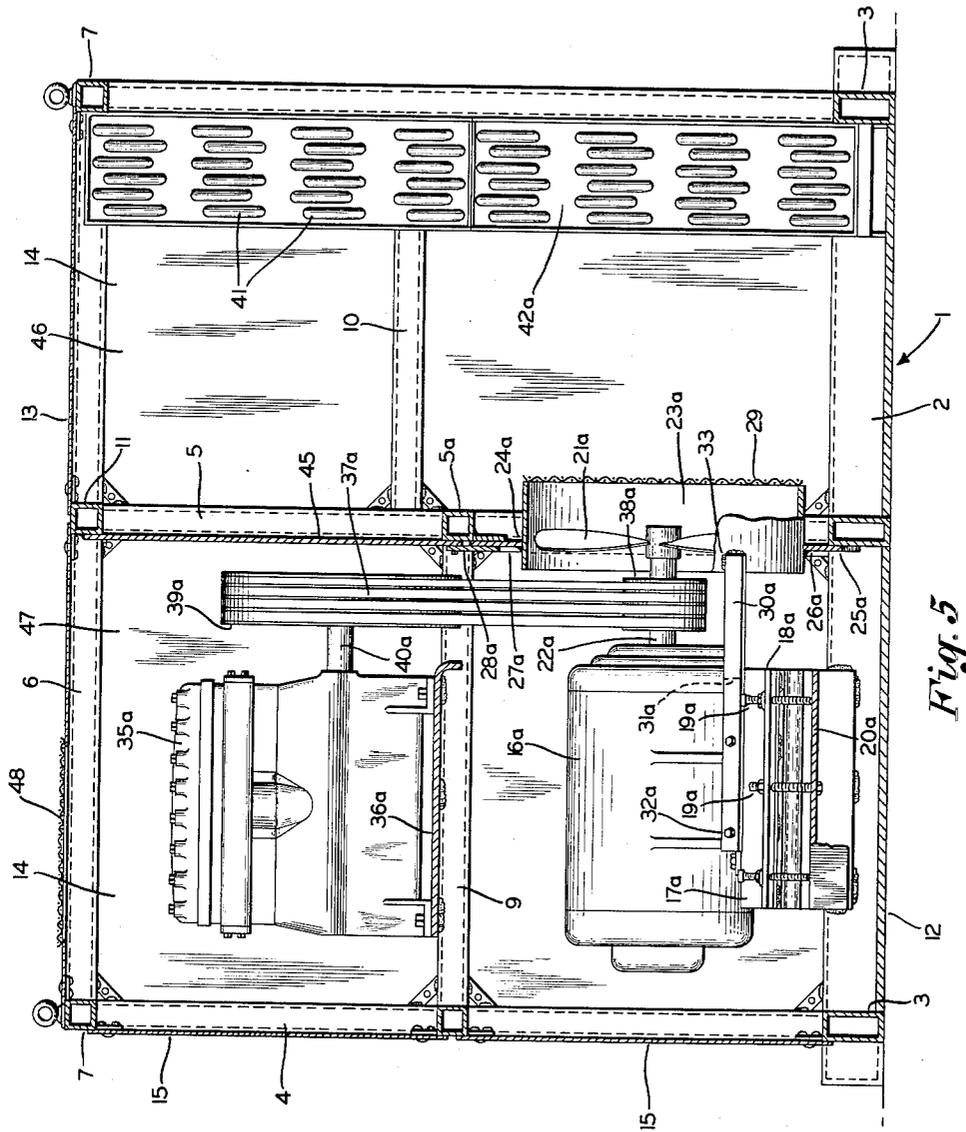


Fig. 5

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AIR SEAL FOR ADJUSTABLE MOTOR MOUNT
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Filed Mar. 16, 1961, Ser. No. 96,144
 9 Claims. (Cl. 62-428)

The invention relates to air conditioner apparatus and more particularly to an air seal for adjustable motor mounts for use in either pressure or vacuum air conditioner housings.

Air conditioner apparatus of the character referred to include a housing, a motor located thereon with a fan connected directly to the shaft thereof and located adjacent to an opening in the housing which may be either an air inlet or outlet opening, depending upon whether the fan blows air through the opening or sucks air there-through.

Heat exchanger coils are located in one wall of the housing so that air may be either blown or sucked there-through, as the case may be, for the purpose of cooling the air. A compressor located in the housing is operatively connected to the coils and is driven by the fan motor by means of a belt or belts located over pulleys upon the shafts of the motor and compressor.

In order to compensate for any stretching in these belts, the motor is mounted upon a vertically adjustable platform with means for adjusting the same to compensate for any elongation in the belts.

In such air conditioner apparatus as is now in general use, this adjustment of the motor to compensate for elongation in the belt changes the position of the fan relative to the inlet or outlet opening in the housing, causing a disadvantage in the operation thereof. When the position of the fan relative to this opening is changed all of the air passing through the opening is not passed through the fan or vice versa.

Furthermore, in air conditioner apparatus of this character, the housing comprises a single chamber within which all of the apparatus, including the motor, fan, compressor and coils are located. The entire interior of this chamber is either pressurized or vacuumized, depending upon whether the fan is sucking or blowing air therethrough.

For this reason, it is necessary that the fan motor be shut off in order to make any necessary repairs or adjustments of the apparatus within the chamber. With the fan thus shut off, it is very difficult to properly adjust the apparatus, as such adjustments should be made under actual working conditions.

It is an object of the invention to provide an air seal for the adjustable motor mount, which will overcome the above difficulties in vertically adjusting the motor to compensate for elongation in the belts.

Another object of the invention is to provide apparatus of this character in which a ring or hollow cylinder surrounding the fan is located through and connected to a plate slidably mounted in the adjacent end wall of the cabinet, said ring being connected to the adjustable base or platform for the motor, the ring forming the inlet or outlet opening, as the case may be, so that the same is always in proper alignment with the fan regardless of the adjusted position thereof.

A further object of the invention is to provide apparatus of the character referred to in which a seal is provided for the slidable plate connected to the ring.

It is also an object of the invention to provide air conditioner apparatus in which a transverse partition divides the same into two chambers, the improved air seal for adjustable motor mount being located in this partition

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wall, one chamber containing the motor, fan and compressor and the other chamber containing only the coil.

Only the chamber containing the coils will thus be either pressurized or vacuumized, as the case may be, whereby the motor may be operated while necessary adjustments or repairs are made to the motor or compressor, thus permitting the adjustments to be made under actual working conditions.

The above objects, apparent from the drawings and following description, may be attained, the above described difficulties overcome and the advantages and results obtained, by the apparatus, construction, arrangement and combinations, subcombinations and parts which comprise the present invention, a preferred embodiment of which, illustrative of the best mode in which applicant has contemplated applying the principle, being set forth in detail in the following description and illustrated in the accompanying drawings.

In general terms the invention may be briefly described as comprising a housing within which are located a motor, a fan connected directly to the motor shaft, and a compressor operatively connected to the motor by belt means located over pulleys mounted upon the shafts of the motor and compressor.

The motor is mounted upon a vertically adjustable base, and a ring or hollow cylinder surrounding the fan is rigidly supported upon this adjustable base. A plate is slidably mounted in the adjacent end wall of the cabinet and provided with an opening forming either an inlet or outlet as the case may be.

The ring or hollow cylinder surrounding the fan is located through this opening and rigidly attached to the sliding plate, whereby vertical adjustment of the motor to compensate for elongation of the belt means will cause the sliding plate to move in unison therewith so that the inlet or outlet opening therein always remains in proper alignment with the fan regardless of the adjusted position thereof.

The invention further contemplates the provision of a transverse partition within the cabinet, dividing the interior of the cabinet into two chambers, the motor, fan and compressor being located in one chamber and the coils being located in the other chamber.

The improved air seal device is located in the partition wall, whereby only the chamber containing the coils will be either pressurized or vacuumized, depending upon whether the fan is sucking or blowing air therethrough. This construction permits adjustment of the motor or compressor while the motor is operating, so that adjustments may be made under actual working conditions.

Having thus briefly described the invention, reference is now made to the accompanying drawings, in which:

FIG. 1 is a longitudinal sectional view through an air conditioner apparatus provided with the improved air seal for the adjustable motor mount;

FIG. 2 is an end view of the housing showing the slidable plate through which the fan ring is located;

FIG. 3 is a transverse vertical section on the line 3-3, FIG. 1;

FIG. 4 is a fragmentary transverse, horizontal section on the line 4-4, FIG. 1; and

FIG. 5 is a longitudinal sectional view showing the improved air seal for adjustable motor mount located in a transverse partition wall dividing the housing into two chambers, only one of which is pressurized or vacuumized.

Referring now more particularly to the embodiment of the invention illustrated in FIGS. 1 to 4, in which similar numerals refer to similar parts throughout, the housing for the air conditioner apparatus may be mounted upon a base, indicated generally at 1 and comprising longitudinal and transverse rectangular tubular members 2 and 3.

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The housing comprises a frame formed of the corner uprights 4, intermediate uprights 5 and longitudinal and transverse top members 6 and 7 respectively, all of which may be formed of square metal tubing as indicated in the drawings.

A transversely disposed frame member 8 is connected to the corner members 4 at one end of the housing, at points intermediate the upper and lower ends thereof, and longitudinally disposed intermediate frame members 9 and 10 may extend between the central upright 5 and adjacent corner uprights 4.

A transversely disposed frame member 11 is connected at opposite ends to the top member 6, at the upper end of the intermediate uprights 5. A bottom wall 12 is located upon the base members 2 and 3, and top panels 13 are connected to the top frame members 6, 7 and 11.

Side panels 14 are connected to the uprights 4 and 5, the top frame members 6 and the intermediate longitudinal frame members 9 and 10, and a panel 15, at one end of the housing, is connected to the transverse frame member 8 and the adjacent upright frame members 4 and transverse top member 7.

The apparatus within the housing includes the motor 16 which is mounted upon the vertically adjustable base or platform 17, hinged at one end as shown at 17'. At the other end of the platform an offset flange 18 is provided, through which are located adjusting screws 19 cooperating with the flanged member 20, by means of which the platform 17 and the motor 16 carried thereon may be vertically adjusted around the hinge point 17'.

A fan 21 is fixed upon the shaft 22 of the motor and rotates within the ring or hollow cylinder 23, the blades of the fan having only sufficient clearance within the interior of the cylinder to permit free rotation of the fan.

The ring 23 is located through an opening 24 in a flat metal plate 25 and fixed thereto, as by welding, as indicated at 26. The plate 25 is slidably mounted in the adjacent end of the housing frame, between the adjacent upright frame members 4 and angular guides 27 and 28 attached to and spaced from the adjacent upright frame members 4 and the intermediate transverse frame member 8.

A grill 29 may be mounted upon the outer end of the ring 23, which forms the inlet or outlet opening, as the case may be, for the interior of the housing. The ring 23 is supported from the base or platform 17 for the motor by means of a pair of longitudinally disposed bars 30 connected to the platform as by the upright flanges 31 and bolts 32 and connected to the lower exterior portion of the ring 23 as by welding, as indicated at 33.

With this construction, it will be seen that as the motor is adjusted vertically within the housing, the ring 23 will be moved in unison therewith, the plate 25 attached to the ring sliding between the frame members 4 and 8 and the guides 27 and 28, providing a seal in all adjusted positions of the ring 23.

A compressor 35 is shown mounted upon a shelf 36, supported upon the intermediate longitudinal frame members 9. The compressor is adapted to be driven by the motor 16 through V-belts 37 located around the pulleys 38 and 39 mounted upon the motor shaft 22 and the compressor shaft 40.

As the motor is adjusted vertically within the housing to compensate for any stretch in the belts 37, the ring 23, forming the inlet or outlet opening, as the case may be, will be moved with the motor so that at all times it will be in proper alignment with the fan, while the sliding plate 25, attached to the ring 23, sliding between the frame members 4 and 8 and the guides 27 and 28, will provide a seal for this end of the housing, regardless of the adjusted position of the motor and ring.

Located within the other end of the housing is a conventional arrangement of heat exchange coils, indicated generally at 41, operatively connected to the compressor 35 in any usual and well known manner (not shown).

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The usual vanes 42 are connected to the coils 41 so that there will be a rapid exchange of heat between the same and air being blown or sucked through the coils, depending upon whether the fan 21 is arranged for blowing or sucking air.

In FIG. 5 is shown a modification of the invention in which the housing may be divided by a transverse partition wall into two chambers. The improved air seal for the adjustable motor mount is located in this partition wall. Only the coil is located in the chamber of the housing which may be pressurized or vacuumized, as the case may be.

The motor and compressor are located in the other chamber, which is neither pressurized nor vacuumized. This permits operation of the motor while adjustments are made to the same or to the compressor.

In this form of the invention the base, frame members and wall panels may be of the same construction as shown in FIGS. 1 to 4 and the same reference numerals are used to indicate these parts.

A transverse partition wall 45, attached to the intermediate upright frame members 5, divides the interior of the housing into the air-tight pressurized or vacuumized chamber 46 and the motor and compressor chamber 47, which is neither pressurized nor vacuumized.

The motor 16a may be of the same construction as the motor shown in FIGS. 1 to 4, but the position of the motor is reversed so that the shaft 22a thereof is disposed toward the transverse partition wall rather than toward the adjacent end of the housing as in FIG. 1.

The base or platform 17a of the motor may be of the same construction as shown in FIGS. 1 to 4, being hinged at one end as above described and having the offset flange 18a at its other end, through which are located the adjusting screws 19a cooperating with the flanged member 20a by means of which the platform and motor may be vertically adjusted around the hinge point in the manner above described.

A fan 21a is fixed upon the shaft 22a of the motor and rotates within the ring or hollow cylinder 23a. This ring is located through an opening 24a in the slidable metal plate 25a and welded or otherwise connected thereto as shown at 26a.

The plate 25a is slidably mounted beneath the partition 45, between the intermediate upright frame members 5 and the intermediate transverse frame member 5a, and the angular guides 27a and 28a, attached to and spaced from said upright frame members 5 and transverse frame member 5a respectively.

The ring 23a is supported from the base or platform 17a of the motor by means of the longitudinally disposed bars 30a connected to the platform, as by the upright flanges 31a and bolts 32a, and connected to the lower exterior portion of the ring 23a as shown and described with reference to the form of the invention illustrated in FIGS. 1 to 4.

A compressor 35a is mounted upon a shelf 36a supported upon the intermediate longitudinal frame members 9, the compressor, however, being reversed in position from that shown in FIG. 1. The compressor is adapted to be driven by the motor through V-belts 37a located around the pulleys 38a and 39a mounted upon the motor shaft 22a and the compressor shaft 40a respectively.

The motor may be adjusted vertically within the housing to compensate for any stretch in the belts, in the same manner as above described, the ring 23a forming the inlet or outlet, as the case may be, to the air-tight chamber 46.

In the same manner as above described, when the motor is adjusted vertically, the ring will be moved therewith so that at all times it will be in proper alignment with the fan, while the sliding plate 25a, attached to the ring, sliding between the frame members 5 and 5a and the

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guides 27a and 28a, respectively, will provide a seal in the manner above described.

An air inlet 48 may be located in any suitable place in the motor and compressor chamber 47, so that air will be blown by the fan 22a through the ring 23a directly through the coil 42a located in the opposite end of the air-tight chamber 46.

With this construction it will be seen that only the air-tight chamber 46 will be pressurized or vacuumized, as the case may be, while the chamber 47, in which the motor and compressor are located, is neither pressurized nor vacuumized.

With this construction one or more wall panels may be removed from the housing to permit access to the motor and/or compressor, and adjustments may be made upon the same while the motor continues to operate, thus permitting the adjustments to be made under actual working conditions.

In the foregoing description, certain terms have been used for brevity, clearness and understanding, but no unnecessary limitations are to be implied therefrom beyond the requirements of the prior art, because such words are used for descriptive purposes herein and are intended to be broadly construed.

Moreover, the embodiments of the improved construction illustrated and described herein are by way of example, and the scope of the present invention is not limited to the exact details of construction.

Having now described the invention or discovery, the construction, the operation, and use of preferred embodiments thereof, and the advantageous new and useful results obtained thereby; the new and useful construction, and reasonable mechanical equivalents thereof of obvious to those skilled in the art, are set forth in the appended claims.

I claim:

1. An air seal for an adjustable motor mount in an air conditioner comprising a housing, a motor located in the housing and having a shaft, a fan upon the motor shaft and means for vertically adjusting the motor, said air seal comprising a ring surrounding the fan, means rigidly connecting said ring to the motor, a slidable plate having an opening therein, the ring being located through said opening, means connecting the ring to the slidable plate at said opening, the slidable plate forming a wall portion of the housing, and guide means on the housing forming a seal for the edges of the slidable plate.

2. An air seal for an adjustable motor mount in an air conditioner comprising a housing, a motor located in the housing and having a shaft, a fan upon the motor shaft and means for vertically adjusting the motor, said air seal comprising a ring surrounding the fan, bars rigidly connecting said ring to the motor, a slidable plate having an opening therein, the ring being located through said opening, means connecting the ring to the slidable plate at said opening, the slidable plate forming a wall portion of the housing, and guide means on the housing forming a seal for the edges of the slidable plate.

3. An air seal for an adjustable motor mount in an air conditioner comprising a housing, a motor located in the housing and having a shaft, a fan upon the motor shaft, a platform upon which the motor is mounted, means hingedly mounting one end of the platform, and means for vertically adjusting the other end of the platform, said air seal comprising a ring surrounding the fan, means rigidly connecting said ring to the motor platform, a slidable plate having an opening therein, the ring being located through said opening, means connecting the ring to the slidable plate at said opening, the slidable plate forming a wall portion of the housing, and guide means on the housing forming a seal for the edges of the slidable plate.

4. An air seal for an adjustable motor mount in an

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air conditioner comprising a housing, a motor located in the housing and having a shaft, a fan upon the motor shaft, a platform upon which the motor is mounted, means hingedly mounting one end of the platform, and means for vertically adjusting the other end of the platform, said air seal comprising a ring surrounding the fan, bars rigidly connecting said ring to the motor platform, a slidable plate having an opening therein, the ring being located through said opening, means connecting the ring to the slidable plate at said opening, the slidable plate forming a wall portion of the housing, and guide means on the housing forming a seal for the edges of the slidable plate.

5. An air seal for an adjustable motor mount in an air conditioner including a housing comprising frame members and wall panels connected thereto, a motor located in the housing and having a shaft, a fan upon the motor shaft, and means for vertically adjusting the motor, said air seal comprising a ring surrounding the fan, means rigidly connecting the ring to the motor, a slidable plate having an opening therein, the ring being located through said opening, means connecting the ring to the slidable plate at said opening, the slidable plate forming a wall portion of the housing, and guide members upon certain of the frame members forming a seal for the edges of the slidable plate.

6. An air seal for an adjustable motor mount in an air conditioner including a housing comprising frame members and wall panels connected thereto, a motor located in the housing and having a shaft, a fan upon the motor shaft, and means for vertically adjusting the motor, said air seal comprising a ring surrounding the fan, means rigidly connecting the ring to the motor, a slidable plate having an opening therein, the ring being located through said opening, means connecting the ring to the slidable plate at said opening, the slidable plate forming a wall portion of the housing, and angle guide members upon certain of the frame members forming a seal for the edges of the slidable plate.

7. In an air conditioner comprising a housing, a transversely disposed partition wall dividing the housing into two chambers, one of said chambers being air-tight and pressurized, heat exchange coils forming a portion of the outer walls of said air-tight pressurized chamber, a motor located in the other chamber and having a shaft, a fan upon the motor shaft, there being an air inlet for the fan in said other chamber, a ring surrounding the fan, means rigidly connecting said ring to the motor, a plate forming a portion of said transverse partition wall, there being an opening in said plate, the ring being located through said opening, means connecting the ring to the plate at said opening, and sealing means at the edges of said plate.

8. In an air conditioner comprising a housing, a transversely disposed partition wall dividing the housing into two chambers, one of said chambers being air-tight and pressurized, heat exchange coils forming a portion of the outer walls of said air-tight pressurized chamber, a motor located in the other chamber and having a shaft, means for vertically adjusting the motor, a fan upon the motor shaft, there being an air inlet for the fan in said other chamber, a ring surrounding the fan, means rigidly connecting said ring to the motor, a slidable plate forming a portion of said transverse partition wall, there being an opening in said plate, the ring being located through said opening, means connecting the ring to the plate at said opening, and guide means providing a seal at the edges of said plate.

9. In an air conditioner comprising a housing, a transversely disposed partition wall dividing the housing into two chambers, one of said chambers being air-tight and pressurized, heat exchange coils forming a portion of the outer walls of said air-tight pressurized chamber, a motor located in the other chamber and having a shaft, a compressor located in said other chamber above the motor,

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a shaft on the compressor, pulleys upon the motor shaft and compressor shaft, belt means located around said pulleys, means for vertically adjusting the motor to keep said belt means taut, a fan upon the motor shaft, there being an air inlet for the fan in said other chamber, a ring surrounding the fan, means rigidly connecting said ring to the motor, a slidable plate forming a portion of said transverse partition wall, there being an opening in said slidable plate, the ring being located through said opening, means connecting the ring to the slidable

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plate at said opening, and guide means providing a seal at the edges of said slidable plate.

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