Sept. 8, 1959 R. D. STRUB 2,903,209

VIBRATION DAMPENING MOUNT FOR MOTOR

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Fig. 1.

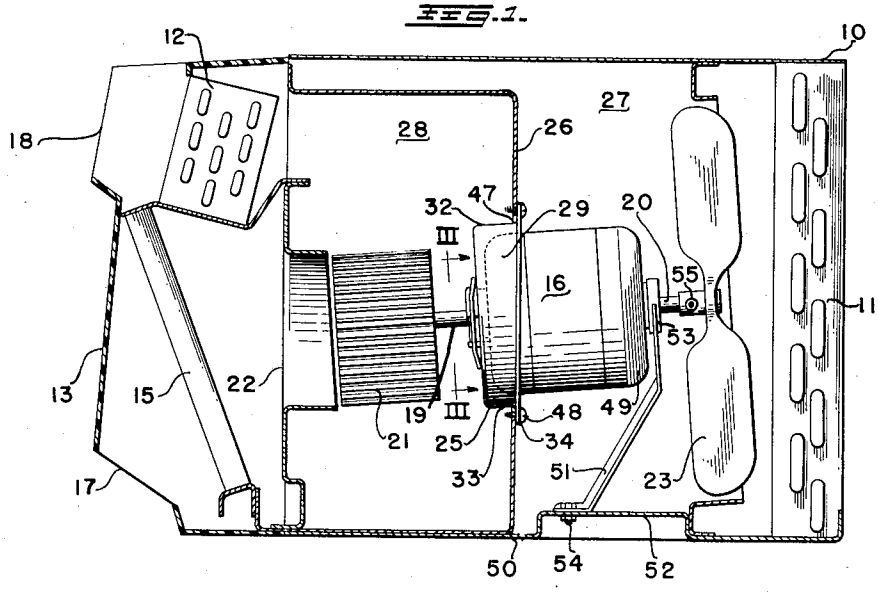


Fig. 2.

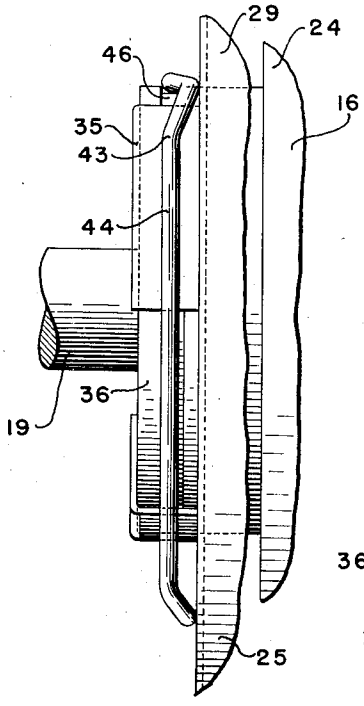


Fig. 3.

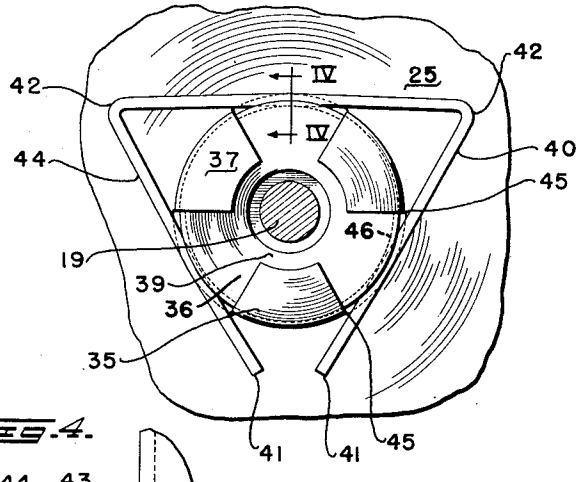
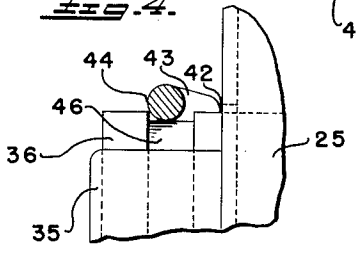


Fig. 4.



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VIBRATION DAMPENING MOUNT FOR MOTOR

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3 Claims. (Cl. 248—15)

This invention generally relates to the mounting of motors and more particularly is directed to an electrical fan motor mount in an air conditioner where the conservation of space is of the essence.

It is well known in the art to utilize a single fan motor for providing power to the condenser fan and evaporator fan in the conventional type air conditioner. The fan motor drives the squirrel cage fan which circulates air through the evaporator thus cooling and dehydrating it. The condenser fan which is powered by the same fan motor draws air over the condenser, thereby removing heat from the refrigerant which passes through the condenser coils. In the past, it has been the general practice to mount the fan motor completely inside the machine compartment of the room air conditioner, with only the shaft extending through a vertical partition which supports the evaporator fan in the evaporator compartment.

By this invention, I have provided a novel structure for mounting and assembling a fan motor assembly with a substantial savings in space, but not at the sacrifice of efficiency or capacity of the air conditioner unit. The partition panel which divides the evaporator compartment from the machine compartment has a removable cup-shaped member protruding into the evaporator chamber and in which one end of the fan motor is mounted. Part of the space which is required for the fan motor is provided by the evaporator compartment as well as the machine compartment, thus providing a reduction in overall length of the air conditioner without making it necessary to expand in another dimension.

The principal object of this invention is to provide an improved means for mounting the fan motor in a room air conditioner.

Another object is to provide a fan motor mount which makes possible the conservation of space within the air conditioner.

Still another object of this invention is to provide a fan motor mount which eliminates the effects of vibrations during normal operation.

Still a further object of this invention is to provide an improved structure comprising a fan motor assembly mounting means which includes both the condenser fan and the evaporator fan.

It is a further object to provide a fan motor mount which facilitates manufacturing and assembly in an otherwise in accessible or congested area.

Still another object of the present invention is to provide a fan motor mount and assembly which may be easily disassembled for servicing.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings where the preferred form of the present invention is clearly shown.

In the drawings:

Figure 1 is a vertical cross-sectional view of the room air conditioner containing my invention with certain parts omitted for the purposes of clarity;

Figure 2 is an enlarged fragmentary side view of my invention;

Figure 3 is a fragmentary view of the motor mounting taken on line III—III of Figure 1;

Figure 4 is a fragmentary cross-sectional view taken on line IV—IV of Figure 3.

As shown in the drawings:

Referring to the drawings, the number **10** denotes an air conditioner outer cabinet which contains a conventional refrigeration system, including a compressor (not shown), a condenser **11**, an evaporator **12**, and the necessary tubing (not shown) to connect the refrigeration components. A decorative front **13** is attached to the outer cabinet **10**. The decorative front **13** and the cabinet **10** house the evaporator **12**, a filter **15**, and the controls for the refrigeration system and the fan motor **16**. The decorative front **13** contains a return air inlet **17** located at its lower part and an air discharge opening **18** at the top portion thereof.

The fan motor **16** has a shaft extending from either end; the shaft **19** for the evaporator fan, and a shaft **20** for the condenser fan. In the specific embodiment of the air conditioner which serves as a setting or this invention a sirocco fan **21** is mounted on the shaft **19** and a blade fan is mounted on the shaft **20** all being powered by the fan motor **16**. In operation, the sirocco fan **21** draws air through the return air inlet **17**, through the filter **15**, through the sirocco fan inlet **22**, and then discharges the air through the evaporator **12**, and thence into the room through the discharge outlet **18**. Deflectors may be mounted in the inner discharge opening **18** for directing the air flow into the room. The condenser fan **23** which is mounted on the shaft **20** forces air through the condenser **11** which facilitates the removal of heat from the refrigerant in the condenser coils.

In a preferred arrangement the fan motor **16** is mounted at an angle as shown. The evaporator end **24** of the fan motor **16** is mounted in a cup-shaped bell housing **25** which is secured to the partition panel **26**. This panel separates the machine compartment **27** from the evaporator chamber **28**.

The bell housing **25** has side walls **29** of unequal length. Thus, the top **32** of the bell housing **25** extends further into the chamber **28** than the bottom **33**. Therefore, the tilt of the bell housing **25** corresponds to the angle of the fan motor **16**. The bell housing **25** is circular in shape and has a peripheral flange **34** to secure it to the partition panel **26**. An embossment **35** of cylindrical form is centrally located in member **25**, the diameter and depth of the embossment **35** being determined by the fan motor hub **36**. The embossment **35** is cut away to provide three spaced apart and equal sections or arms **37** of substantially L shape the inner ends of the axially outer arms of which are concave defining an aperture **39**. The shaft **19** of the fan motor **16** extends through the aperture **39** and the fan motor hub **36** fits into the arms **37** defining embossment **35**. The hub **36** is held in place by a triangular-shaped resilient spring clip **40**.

The clip **40** terminates at points **41** leaving one apex of the triangle open to assist in forming a resilient motor mount. As shown in Figures 2 and 4, the triangular-shaped clip **40** is formed so that the apexes are bent out of the plane of the rest of the clip **40**. Thus only the apexes **41** and **42** are in contact with the bell housing **25**. The clip **40** is spot welded to the bell housing **25** at both apexes **42**, or is otherwise securely held in place at those points. Because of the bend **43** the straight side portions or arms **44** of the clip **40** are maintained in spaced relationship to the bell housing **25**. Each side or arm **44** of the triangular clip **40** bridges the space between two adjacent sections or arms **37** and contacts the

latter at points 45. Thus, when the motor 16 is placed in the bell housing 25 and the hub 36 is inserted into embossment 35, the triangular spring clip 40 is expanded to receive the hub 36, by forcing the downwardly extending side arms 44 of clip 40 apart. As hub 36 reaches its innermost position in embossment 35, the side arms 44 of clip 40 snap into a circumferential groove 46 of the hub 36, thereby holding the motor 16 securely and at the same time free from vibration effects.

A partition panel 26 contains an opening 47 through which is inserted the bell housing 25. This opening is of sufficient size to accommodate the sirocco fan 21 so that it may be inserted through the opening during the assembly process. The peripheral flange 34 on the bell housing 25 is of sufficient diameter to form a lap joint on the panel 26, thus completely covering the opening 47. Sheet metal screws 48 or other suitable means may be used to secure the bell housing 25 to the panel 26.

The condenser end 49 of the fan motor 16 is secured to the conditioner base pan 50 by means of the angular support 51. The air conditioner base pan 50 has an embossment 52 to which is secured the angular motor support 51. The support 51 is suitably secured to the fan motor hub 53 and is secured to the embossment 52 by machine bolts 54 or other suitable means.

The fan motor assembly, including the fan motor 16, the bell housing 25, the sirocco fan 21, and the angular motor support 51 can be assembled simply and easily. The fan motor 16 and the bell housing 25 must be assembled first. Place the motor 16 in bell housing 25 with the shaft 19 extending through the aperture 39 and hub 36 fitting into the embossment 35. Expand the clip 40 and release into the groove 46 of the fan motor hub 36. Place the sirocco fan 21 on the shaft 19, then secure the support 51 to the hub 53. Place the whole assembly in the air conditioner and secure the flange 34 to the panel 26 and the angular motor support 51 to the embossment 52. The condenser fan 23 is then placed on the shaft 20 and secured with set screw 55 after the fan motor assembly is placed in the air conditioner. To remove this assembly simply reverse the procedure outlined above.

While in the foregoing specification I have set forth a single structure in considerable detail for the purposes of illustrating one embodiment of my invention, such details of structure may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim as my invention:

1. In a window air conditioner, a fan motor having a first hub on one end and a second hub on the opposite end, mounting means therefore comprising in combination a first support engaging said first hub, a second support engaging said second hub comprising in combination a cup-shaped member having side walls of unequal depth and a flanged periphery, said cup-shaped member being of a larger diameter than said fan motor whereby in the assembled position said fan motor is partially enclosed by said cup-shaped member, an embossment extending centrally from said cup-shaped member and cut away to provide a central aperture and spaced substantially L-shaped sections, said second hub being seated within said embossment, a spring clip secured to said cup-shaped member and lying across the spaces between said sections, said spring clip engaging said second hub, said spring clip comprising a triangular member, the apexes of said triangle being bent out of the plane described by the rest of the triangular member, said triangular member being secured to said cup-shaped member at said apexes.

2. In a motor mounting for a window air conditioner, a motor having a first hub at one end and a second hub at its other end, a first support engaging said first hub, a second support comprising a substantially cylindrical housing receiving said other end portion of said motor and a substantially cylindrical embossment concentric with said housing formed integrally therewith and extending outward therefrom, said embossment having spaced openings in its circumferential wall and said second hub fitting in said embossment and being provided with a circumferential groove exposed through said openings, and a substantially triangular spring clip comprising three arms two of which are integrally connected at one end to the ends of the third arm and are free from each other at their other end, the corner portions of said clip at the ends of said third arm being bent toward and fixed to said housing and the free end portions of said two arms being bent toward and bearing against said housing but free therefrom, the arms of said clip extending across said openings chordally of said embossment in the plane of said groove and extending into the latter, said two arms being movable apart by insertion therebetween of said second hub for snapping into said groove as said second hub reaches its fully inserted position in said embossment.

3. In a motor mounting for a window air conditioner, a motor having a first hub at one end and a second hub at its other end, a first support engaging said first hub, a second support, a mounting member and a substantially cylindrical embossment fixed to said member and receiving said second hub, said embossment having spaced openings in its circumferential wall and said second hub having a circumferential groove exposed through said openings, and a substantially triangular spring clip comprising three arms two of which are integrally connected at one end to the ends of the third arm providing corners therewith and are free from each other at their other ends, said corners of said clip being fixed to said member and the free end portions of said two arms being bent toward and bearing against said support but free therefrom, the arms of said clip being otherwise spaced from said member and extending across said openings chordally of said embossment in the plane of said groove and extending into the latter, said two arms being movable apart by insertion therebetween of said second hub for snapping into said groove as said second hub reaches its fully inserted position in said embossment.

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