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REFRIGERATING APPARATUS

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2 Claims. (Cl. 230—235)

This invention relates to refrigerating apparatus and more particularly to hermetically sealed motor-compressor units for use in connection with such apparatus.

It is an object of the present invention to provide an improved arrangement for mounting a motor-compressor unit within a sealed casing.

It is another object of the present invention to provide an improved mounting arrangement for a motor and compressor unit within a sealed casing which will minimize and absorb the operational vibrations of the motor and compressor and retain same in proper position during operation and in transportation thereof.

It is another object of the present invention to provide an improved mounting arrangement for a motor and compressor within a sealed casing which is simple in construction and permitting an easy and quick mounting of the motor and compressor and which is highly efficient in use.

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

In the drawing:

Fig. 1 is a front view of a refrigerating apparatus embodying features of my invention and showing a portion thereof broken away;

Fig. 2 is a view taken along line 2—2 of Fig. 1 and showing a portion thereof broken away; and

Fig. 3 is a fragmentary view taken along line 3—3 of Fig. 1.

Shown in the drawing is a motor-compressor unit 10 which comprises in general a compressor 12 and an electric motor 14 mounted within a sealed casing 18.

The casing 18 consists of an upper shell 20 and a lower shell 22 which are welded together at their respective flanges 23 and 24 to form a sealed chamber 26.

The compressor 12 includes a casting 28 having a cylinder block 30. A sleeve 32 is pressed in the block 30 to provide a cylinder 34. A vertically extending drive shaft 36 is journaled in a bearing 38 provided in the casting 28. A piston 39 is connected to shaft 36 by a connecting rod 40 for operation in the cylinder 34.

The motor 14 includes a rotor 42 mounted on the upper end of the shaft 36 and a stator 43 mounted on the compressor casting 28. Thus the casting 28 supports both the compressor and motor parts as a unit.

The supporting casting 28 is mounted upon a pair of resilient supporting units 50 which are identical in construction. Each supporting unit 50 comprises a bracket 54 having legs 56 and 58 which are welded to the side and bottom walls respectively of the lower shell 22. Extending from leg 56 is a horizontally extended section 64 having a downwardly depending vertical section 65 joined to leg 58. Secured on the horizontal section 64 is an upwardly extending stud 66. The stud 66 is formed with a spiral groove 68 upon which is threaded one end of a

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coiled spring 70. The casting 28 includes two hollow bosses 72 which are identical in shape. One of these bosses rests upon the upper end of one coiled spring 70 and the other boss rests upon the upper end of the other coiled spring 70. Each boss 72 is provided with a reduced portion 73 with one being received in one coiled spring and one in the other to prevent disengagement of the coiled springs from the bosses 72.

The supporting units 50 are located within the chamber 26 so that the units are positioned diametrically opposite each other and on a line that extends substantially through the center point of gravity of the casting 28 and the motor and compressor parts supported thereby. The units 50 are positioned on opposite sides of the casing 18 and in close proximity to the shell 22.

This arrangement serves not only to support but to balance the motor and compressor in a vertical position.

Cooperating with the supporting units 50 is a stabilizing or snubber unit 80 comprising a bracket 82, a coiled spring 84 and a lug 86 that is formed integrally with the casting 28. The bracket 82 is formed U-shaped having arms 90 and 92 spaced in parallel relationship and joined by a connecting section 94 which is welded to the side wall of the lower shell 22. The lug 86 extends to lie substantially midway between arms 90 and 92 of the bracket 82. A spirally threaded opening 83 extends through the lug 86 into which is threaded the coiled spring 84 until the mid-section of the spring is secured and held in the lug 86. The ends of the spring 84 extend outwardly from opposite sides of the lug a substantially equal distance to engage against respective arms 90 and 92 of the bracket 82. The arm 90 is formed with an inwardly directed sleeve 96 which telescopes into the end of spring 84 to prevent displacement of the spring from arm 90. A similar sleeve 98 is formed on arm 92 for holding the opposite end of spring 84 to the arm.

The stabilizing unit 80 is arranged to be located midway circumferentially on the shell 22 between the supporting units 50. The spring 84 is mounted so that its axis extends parallel to the aforesaid line extending between the centers of the supporting units 50. Though the axis of the shaft 36 may be to one side of the aforesaid center point of gravity, it intersects a radial line constructed from the center point of gravity perpendicular to the axis of the spring 84 while the axis of the spring is tangent to the concentric rotation of the rotor 44. This arrangement permits the stabilizing unit 80 to absorb and minimize the starting rotational shock upon the starting of the electric motor 14 and absorb and minimize the shock in the stopping of the electric motor, as well as preventing the rotation of the mechanism during the operation thereof.

The stabilizing unit 80 co-operating with the supporting units 50 also provides a third point of support to prevent rocking action of the motor and compressor as well as preventing side or lateral movement thereof.

To prevent the mechanism from being unseated from springs 70 by undue upward movement thereof, as may occur in transportation, the shaft 36 is provided with an extension 110 which terminates adjacent the top wall of the upper shell 20. The space between the end of shaft extension 110 and top wall is less than the length of the extension of each boss 72 into each spring 70 so that the extension 110 will strike the top wall of the shell without permitting the disengagement of the springs 70 from bosses 72. Secured to top wall of the casing 18 is a downwardly extended sleeve 114 into which the shaft extension 110 projects which also serve to limit movement and prevent displacement of the mechanism

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from its support should it be unduly tilted from a vertical position.

By the present mounting arrangement of two coiled springs mounted on the horizontal legs of the brackets adjacent the bottom wall of the casing very little vibrations are transmitted to the casing. Also by this mounting and by the use of the snubber spring the motor-compressor unit remains in proper position during operation and in transportation.

The arrangement further serves to minimize and prevent bouncing of the mechanism from one spring 70 toward the other as the springs 84 by its arrangement will resist twisting action. Thus the spring 84 serves not only to snub rotary or vertical directed vibrations, but also rocking action as well. By arranging the supporting and snubbing units 50 adjacent to the underside of the mechanism there is eliminated any tendency for gyrating or rolling action thereby permitting a smoother and quieter operating mechanism as well as longer lasting, by minimizing and eliminating pressure wear of the moving parts of the mechanism.

Although only a preferred form of the invention has been illustrated, and that form described in detail, it will be apparent to those skilled in the art that various modifications may be made therein without departing from the spirit of the invention or from the scope of the appended claims.

I claim:

1. Refrigerating apparatus comprising a casing, a pair of vertically extending coiled springs within said casing

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positioned diametrically opposite each other adjacent the bottom wall of said casing and in close proximity to the side walls of said casing, a motor-compressor unit mounted within said casing on said springs, and a single horizontally extending coiled snubber spring only connected on its ends to a side wall of said casing substantially midway circumferentially on the casing between said vertically extending coiled springs and connected substantially midway between its ends to said motor-compressor unit.

2. Refrigerating apparatus comprising a casing, a pair of brackets positioned within said casing diametrically opposite each other with each having a vertical leg secured to the bottom wall of said casing and each having a horizontally extending leg secured to the side wall of said casing, vertically extending coiled springs mounted in said casing on said horizontally extending legs, a refrigerant compressing mechanism mounted in said casing on said springs, and a single horizontally mounted coiled snubber spring secured to a side wall of said casing substantially midway circumferentially on the casing between said vertically extending coiled springs and to said refrigerant compressing mechanism.

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