

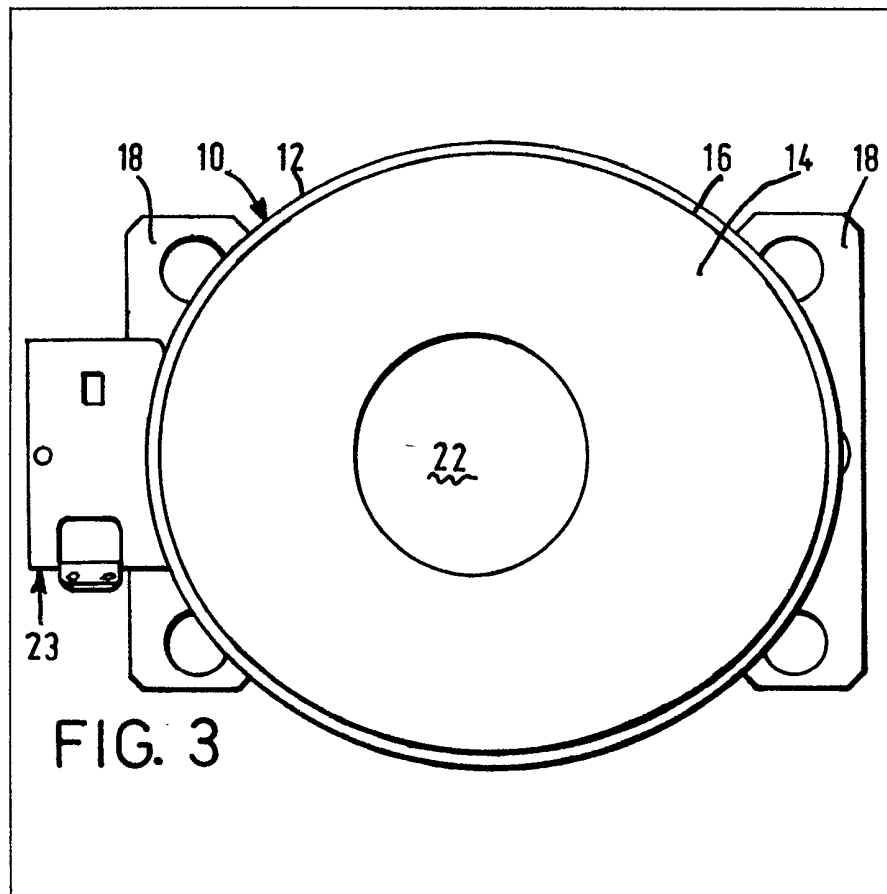
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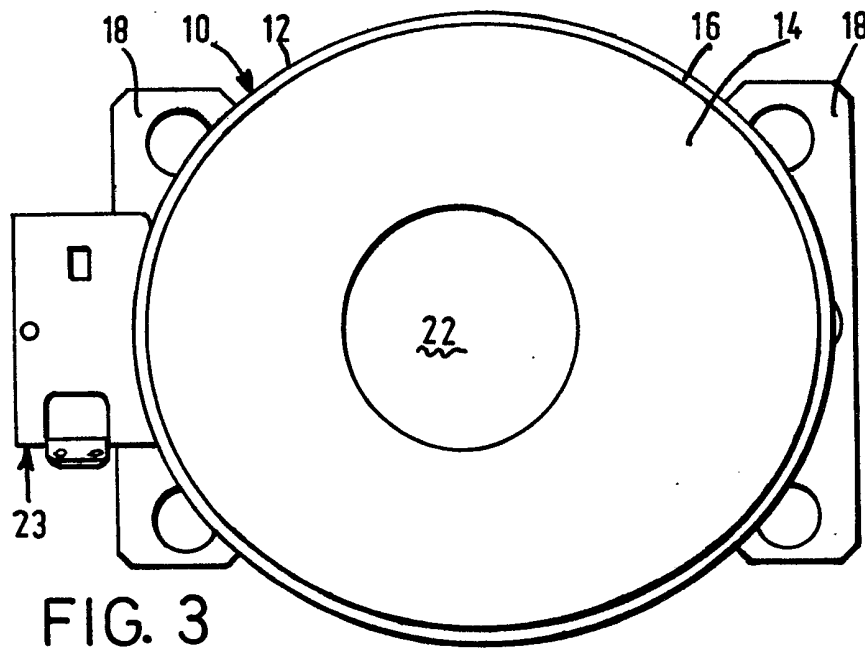
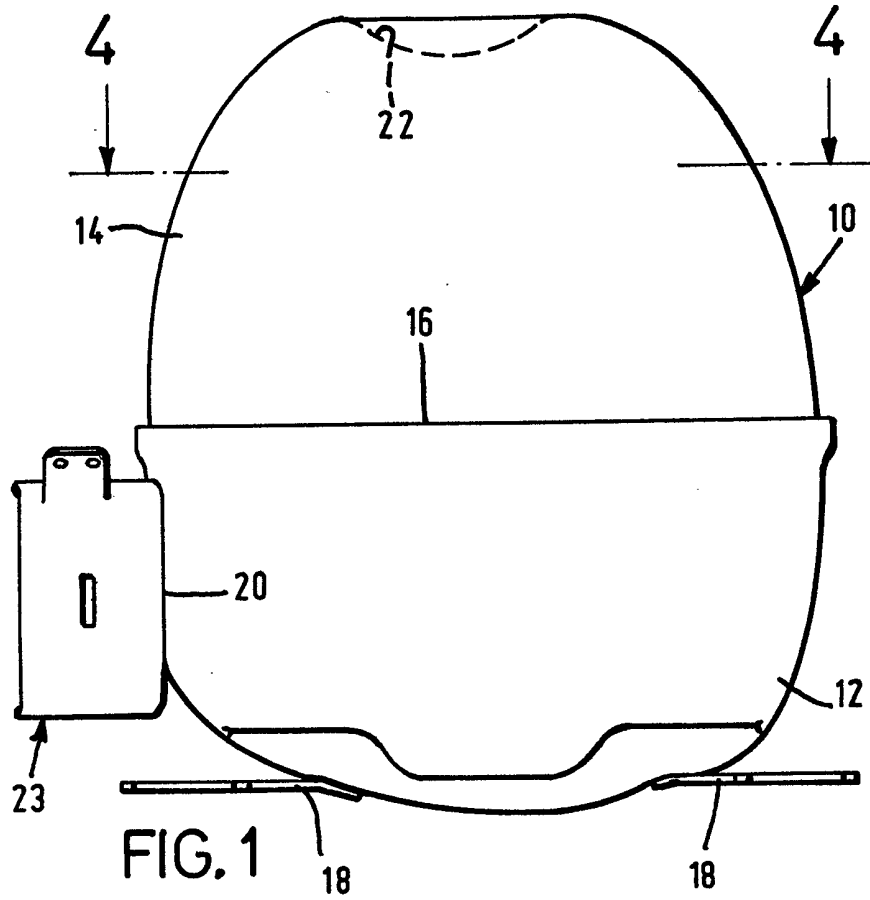
(54) **A motor-compressor unit for a refrigeration system**

(57) A housing (10) for a hermetically sealed motor-compressor unit in a refrigeration system is formed from a lower part (12) and an upper part (14), which are welded together and comprise walls with transverse and vertical asymmetries and a cavity (22)

in the form of a part-spherical cup at the top of the upper part (14), the centre of the circle formed by the intersection of the cup with the upward facing surface of the upper part (14) being disposed eccentrically to the major axis of an ellipse formed by the cross-section of the housing in plan outline.



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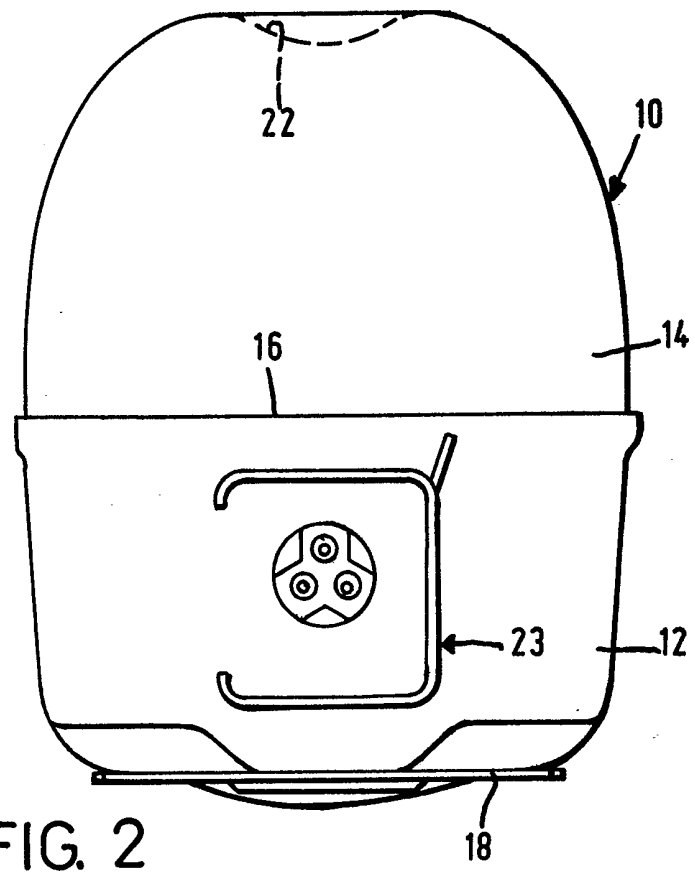


FIG. 2

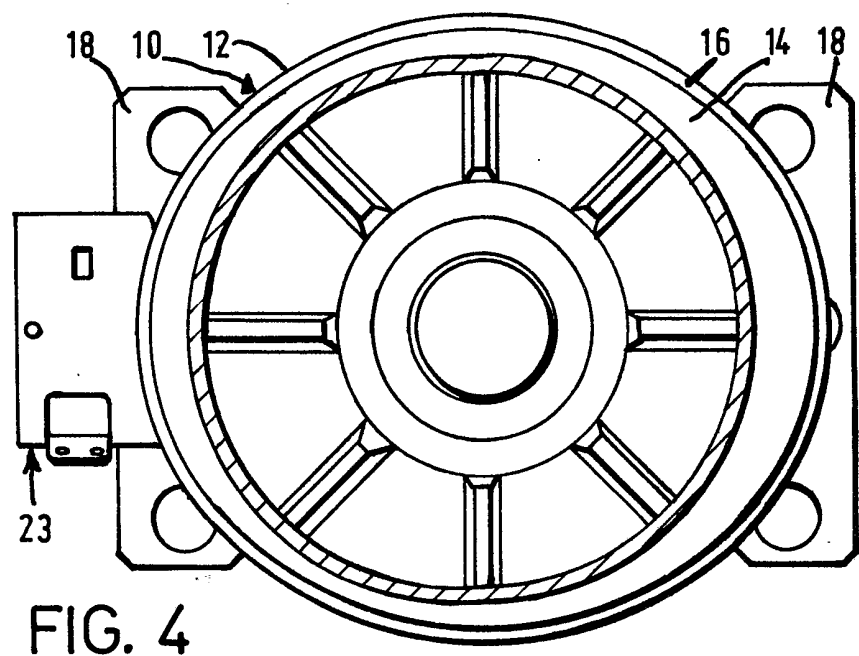


FIG. 4

SPECIFICATION

A sealed motor-compressor unit for a refrigeration system

The present invention relates to a sealed motor-compressor unit for a refrigeration system.

In such units, problems arise due to the noise produced by the motor-compressors and transmitted outwardly by way of the housing of the unit. When the natural vibration frequency of such a housing or container is equal or close to the vibration frequency of the motor-compressor unit or to one of its harmonic frequencies, this represents the most advantageous condition because noise amplification occurs. A primary object in designing motor-compressor units is to reduce noise at their source, particularly in the motor-compressor unit itself, by using silencers in the suction and delivery ducts, aiming at the rotating masses being dynamically balanced, agitating the lubricating oil in order to reduce its sound conduction and suspending the motor-compressor unit on springs in the housing or container.

Theoretical and practical studies have been carried out in the past in order to reduce noise in encapsulated motor-compressor units. The results of these studies have initially suggested that the housing or container should have the shape of a sphere, an ellipse or similar structures of the ovoidal or other types. In this respect, it has been found that these structures have a natural frequency which is very different from the frequency of the motor-compressor in contrast to the classical cylindrical form with its lower and upper ends slightly curved, as used in conventional motor-compressor units.

According to the present invention, there is now provided a sealed motor-compressor unit for a refrigeration system and provided with a housing comprising two parts which are welded together and in use are disposed one above the other, wherein both of the parts are provided with outer walls which are asymmetrical about transverse and vertical axes and the upper part is provided with a cavity of substantially part-spherical shape in an upward facing portion thereof, the unit when viewed from above having an outline substantially in the shape of an ellipse, and the centre of a notional circle formed by the intersection of the cavity with wall surface portions in the upward facing portion being disposed eccentrically of the intersection of the axes of the ellipse.

An embodiment of the present invention will now be more particularly described by way of example with reference to the accompanying drawings, in which:

Fig. 1 is a side view of a motor-compressor unit embodying the present invention,

Fig. 2 is a front view of the unit shown in Fig. 1,

Fig. 3 is a plan view of the unit of Fig. 1 and

Fig. 4 is a section through the motor-compressor unit on the line 4—4 in Fig. 1.

Referring now to the drawings, Fig. 1 shows a housing 10, which comprises a lower part 12 and

65 an upper part 14 welded together along the line 16. Two brackets 18 welded to the housing 10 are provided for fixing the housing to a part of the structure of the appliance concerned.

The shape of the housing 10 is preferably designed to obtain the optimum solution, taking into consideration the overall dimensions of the motor-compressor enclosed by it and the shape which gives greatest rigidity to the housing structure in relation to the nature of the vibrations produced by the motor-compressor. For use with a motor-compressor of vertical axis with the compressor disposed at the bottom, the lower part 12 is provided at the bottom (Fig. 1) with a spherical profile of large curvature which gradually connects to the top of the part in a manner which is asymmetrical about a vertical axis.

The vertical asymmetry is accentuated by a vertical straight wall portion 20 in a position corresponding with a box 23, which is fixed to the housing in a commutator zone and contains connecting terminals and possibly fuses.

In the central part, in a position corresponding with the stator and stator windings of the motor which together form a cylindrical structure, the housing has a profile of small curvature which proceeds upwards to connect to a spherical cup-shaped cavity 22 which is displaced to the left of the vertical axis passing through the centre of an ellipse (Fig. 3) which defines the plan profile of the housing.

In this manner, a vertical asymmetry is obtained, with the right hand profile (Fig. 1) more inclined than the left hand profile.

In Fig. 2, the right hand and left hand profiles have vertical symmetry, with a straight extension at the lower portion 12, and a curved extension at the upper part 14, with the radius of curvature increasing in the higher zones, to connect in an upward facing surface portion with the cavity 22.

Fig. 4 shows the shape of the cross-section through the part 14 of the housing on the line 4—4 in Fig. 1.

The overall structural characteristics heretofore described provide the housing with the ability to considerably damp any noise originating from the operation of the motor-compressor by comparison with conventional housings having an equal thickness of the plate used for its wall construction and equal overall dimensions.

115 CLAIMS

1. A sealed motor-compressor unit for a refrigeration system and provided with a housing comprising two parts which are welded together and in use are disposed one above the other, wherein both of the parts are provided with outer walls which are asymmetrical about transverse and vertical axes and the upper part is provided with a cavity of substantially part-spherical shape in an upward facing portion thereof, the unit when viewed from above having an outline substantially in the shape of an ellipse, and the centre of a notional circle formed by the intersection of the

cavity with wall surface portions in the upward facing portion being disposed eccentrically of the intersection of the axes of the ellipse.

2. A unit as claimed in claim 1, wherein the
5 centre of the notional circle is on the major axis of

the ellipse.

3. A sealed motor-compressor unit for a refrigeration system and substantially as hereinbefore described with reference to and as
10 illustrated by the accompanying drawings.