A Compressor

The present disclosure relates to a compressor.

One of the biggest challenges faced with electric motors is keeping the components of the electric motor cool during use. In the case of compressors, the airflow generated by the compressor can be utilised to cool some of the components of the motor. However, it is often the case that the airflow through the compressor is restricted, and is not able to flow past all the components effectively. Therefore the efficiency and performance of the compressor may be limited by the restricted cooling available to a small number of the components.

There is a general desire to improve compressors, such as the motors found in vacuum cleaners, in a number of ways. In particular, improvements may be desired in terms of size, weight, manufacturing cost, performance, efficiency, reliability and noise.

This disclosure provides a compressor comprising: a stator assembly comprising a plurality of stator elements; a rotor assembly comprising a shaft to which is mounted at least one bearing, a permanent magnet and an impeller; a support body; and an outer can comprising an air inlet. The support body comprises a hollow elongate central part to which is mounted the at least one bearing, and inside which the magnet is positioned, the elongate central part comprising a plurality of openings, and the air inlet of the outer can is axially aligned at least partially with the plurality of openings in the elongate central part.

In one aspect, the present disclosure refers to a compressor comprising:

a stator assembly comprising a plurality of stator elements;
a rotor assembly comprising a shaft to which is mounted at least one bearing, a permanent magnet and an impeller;
a support body; and
an outer can comprising an air inlet;

wherein the support body comprises a hollow elongate central part to which is mounted the at least one bearing and inside which the magnet is positioned, the elongate central part comprising a plurality of openings, and the air inlet of the outer can is axially aligned at least partially with the plurality of openings in the elongate central part.

As a result, airflow generated by the compressor during use is able to flow into the compressor through the air inlet of the outer can and through the opening of the elongate central part of the support body to cool the magnet during use. Accordingly, more of the components of the compressor can be cooled effectively, and the performance and efficiency of the compressor can be improved.

The air inlet may comprise at least one large opening such that air enters the compressor in a direction having both axial and radial components. As such, cooling airflow is better able to enter the compressor in a way that provides cooling to all

CLAIMS

1. A compressor comprising:
   a stator assembly comprising a plurality of stator elements;
   a rotor assembly comprising a shaft to which is mounted at least one bearing, a permanent magnet and an impeller;
   a support body; and
   an outer can comprising an air inlet;
   wherein the support body comprises a hollow elongate central part to which is mounted the at least one bearing and inside which the magnet is positioned, the elongate central part comprising a plurality of openings, and the air inlet of the outer can is axially aligned at least partially with the plurality of openings in the elongate central part.

2. A compressor as claimed in claim 1, wherein the air inlet comprises at least one opening such that air enters the compressor in a direction having both axial and radial components.

3. A compressor as claimed in claim 1 or claim 2, wherein the outer can is spaced radially from the support body to form an annular airflow pathway.

4. A compressor as claimed in claim 3, wherein the stator elements extend partially through the plurality of openings, and are fixed to the support body such that they extend into the annular airflow pathway.

5. A compressor as claimed in any one of the preceding claims, wherein a printed circuit board is mounted to an end of the outer can proximate the air inlet.

6. A compressor as claimed in claim 5, wherein larger electronic components mounted to the printed circuit board (PCB) extend from the PCB into an air pathway for air entering the compressor through the air inlet.

7. A compressor as claimed in any one of the preceding claims, wherein, in use, air flows axially through the compressor both inside the support body, and outside the support body.