A Filter Assembly

The present invention relates to a filter assembly.

Filters are key components in products containing motors, and particularly motors which generate a flow of fluid through the product such as vacuum cleaners. Without filters, dirt and debris can enter the motor, reducing its efficiency and performance overtime. In addition, motors themselves can produce emissions in the form of particles which may be undesirable to be released into the atmosphere.

However, the addition of filters to a product can impact the size of the product, particularly if more than one filter is required in order to filter both upstream and downstream of a motor. In addition, filters typically require maintenance by a user, whether that be replacement or removal for cleaning, and multiple filters to maintain can lead to frustration for a user.

Therefore there is a need for improvements to be made to filters that can go some way to alleviate these problems.

A first example of the present disclosure provides a filter assembly comprising: a filter housing; a first filter; and a second filter, wherein the first filter is a pre-motor filter, and the second filter is a post-motor filter, and both the first and second filters are fixed to the filter housing and are annular about a common axis.

In one aspect, the present disclosure refers to a filter assembly comprising: a filter housing; a first filter; and a second filter,
wherein the first filter is a pre-motor filter, the second filter is a post-motor filter, and both the first and second filters are fixed to the filter housing and are annular about a common axis, the filter housing comprises an exposed portion and an enclosed portion, the exposed portion of the filter housing comprises a frame extending from the enclosed portion, and the first filter is positioned around the frame.

By combining both the pre-motor and post-motor filters into a single assembly, a more compact and convenient motor filter assembly can be achieved. Furthermore, a user is able to handle and interact with both filters simultaneously. For example, removing, replacing, washing or cleaning both the filters can be done in a single action instead of the user having to do so for each filter individually. In addition, the annular shape of the filters provides a particularly efficient use of space, whereby a motor can be positioned at least partially within the annular shape defined by the filters.

The cross-sectional shape of one or both of the first and second filters may be one of circular, elliptical or obround. Motors tend to have a generally cylindrical shape, and

minimises any changes of direction for the fluid flow, which can have a negative impact on efficiency and performance of a machine.

The flow direction for the first filter may be radially inwards towards the common axis, and the flow direction for the second filter may be radially outwards away from the common axis. As a result, the filter assembly can conveniently be positioned around a motor positioned along the common axis, maximising the use of space, while providing efficient filtration of fluid flowing into and out of the motor.

A second example of the present disclosure provides a product comprising a motor, and the filter assembly described in any one of the previous statements, wherein the filter assembly at least partially overlaps with the motor in a direction along the common axis.

As a result the filter assembly surrounds the motor in a particularly space efficient arrangement. This helps to minimise the overall size of the product.

The filter assembly may be positioned around the motor such that the first filter is positioned around an inlet to the motor, and the second filter is positioned around an outlet of the motor. As a result, fluid passes through the pre-motor filter directly into the inlet to the motor, and air leaving the motor passes directly through the post-motor filter.

The motor may be housed in a cylindrical motor bucket having a motor bucket inlet and a motor bucket outlet, the filter assembly being positioned around the motor bucket and being removable from the product by sliding the filter assembly over the motor bucket along the direction of the common axis. As a result, the filter assembly can be quickly and easily removed from the motor bucket, and maintenance of the filters is more convenient for a user.

The motor bucket inlet may comprise a plurality of through-holes aligned with the inlet of the motor, and the motor bucket outlet may comprise a plurality of through-holes aligned with the outlet of the motor. As a result, the through holes allow fluid to flow

CLAIMS

1. A filter assembly comprising:

a filter housing;

a first filter; and

a second filter,

wherein the first filter is a pre-motor filter, the second filter is a post-motor filter, and both the first and second filters are fixed to the filter housing and are annular about a common axis, the filter housing comprises an exposed portion and an enclosed portion, the exposed portion of the filter housing comprises a frame extending from the enclosed portion, and the first filter is positioned around the frame.

2. A filter assembly as claimed in claim 1, wherein the cross-sectional shape of one or both of the first and second filters is one of circular, elliptical or obround.

3. A filter assembly as claimed in claim 1 or claim 2, wherein the first filter is adjacent the second filter in a direction along the common axis.

4. A filter assembly as claimed in any of claims 1 to 3, wherein the enclosed portion of the filter housing comprises an outer casing, and the second filter is positioned inside the outer casing.

5. A filter assembly as claimed in claim 4, wherein the outer casing has vent holes.

6. A filter assembly as claimed in any one of the preceding claims, wherein the first filter comprises a layered filter medium.

7. A filter assembly as claimed in any one of the preceding claims, wherein the second filter is a pleated filter.

8. A filter assembly as claimed in any one of the preceding claims wherein the filter housing comprises an annular seal between the first and second filters.