March 2, 1954 W. ARDITO 2,670,896

SUCTION CLEANING APPARATUS

Filed March 6, 1951

FIG. 1.

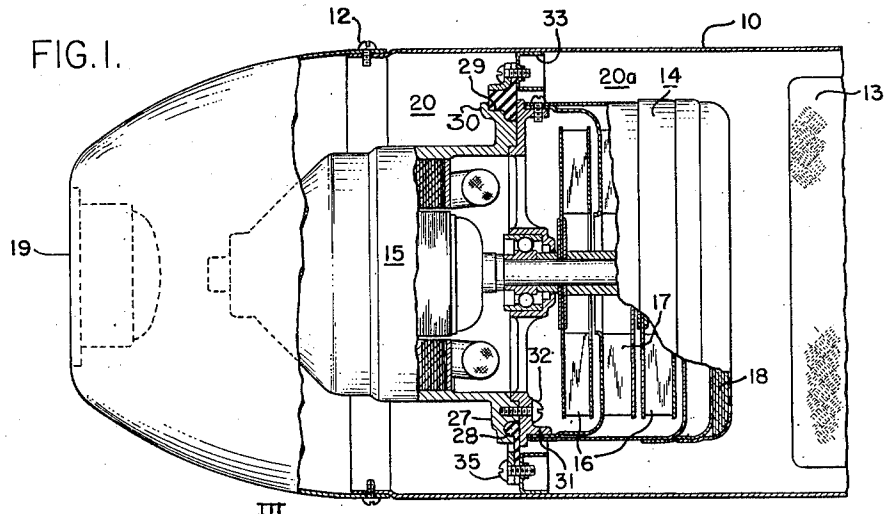
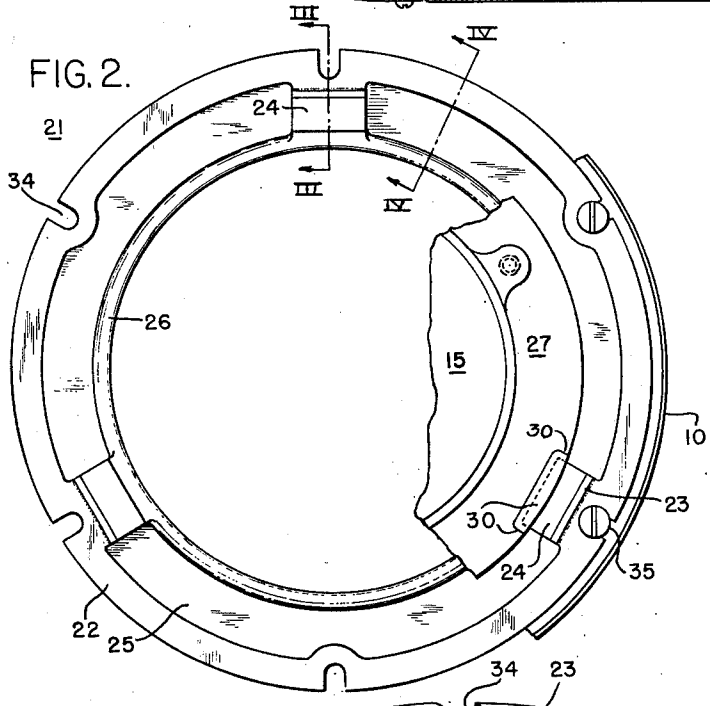


FIG. 2.



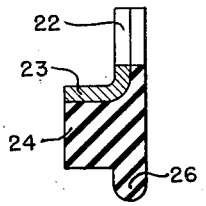


FIG. 3.

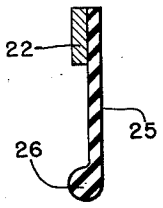


FIG. 4.

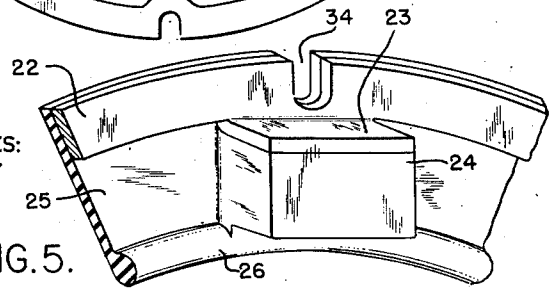


FIG. 5.

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SUCTION CLEANING APPARATUS

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My invention relates to suction cleaning apparatus and air translating apparatus, more particularly to a structure for resiliently mounting a fan motor unit within a casing and for sealing the spaces therein on the suction and discharge sides of the fan motor unit.

It is an object of the invention to provide an improved mounting and sealing structure.

A more particular object is to provide a mounting and sealing structure which is simple in construction and which provides for simple installation and removal of the fan motor unit.

In accordance with my invention, I provide a mounting and sealing member which comprises at its outer periphery a ring, such as metal, which is relatively rigid. The member also includes a plurality of circumferentially spaced resilient members, preferably rubber, which are interposed radially between the outer periphery of the fan motor unit and the inner periphery of the ring, preferably bearing against and bonded or molded to inwardly directed faces provided by integral flanges of the ring. The member further includes an annular thin wall of flexible or resilient material, preferably rubber, which, at its outer periphery, is bonded or molded to the ring and which at its inner periphery is preferably formed with a bead to facilitate its attachment to the fan motor unit as by clamping. The resilient members and the thin wall are preferably formed integral with each other.

These and other objects are effected by my invention as will be apparent from the following description and claims taken in connection with the accompanying drawings, forming a part of this application, in which:

Fig. 1 is a longitudinal sectional view, with a part broken away, of a suction cleaner incorporating my invention;

Fig. 2 is an elevation of the mounting and sealing ring, with fragmentary connected portions of the motor housing and the cleaner casing;

Figs. 3 and 4 are sectional views of the mounting and sealing ring, taken on section lines III—III and IV—IV of Fig. 2, respectively; and

Fig. 5 is a fragmentary perspective view showing a portion of the mounting and sealing ring including one of the supporting blocks.

Referring to the drawing in detail, I show a suction cleaner of the type commonly referred to as a tank type cleaner. The cleaner includes a casing 10 having a cap 11 at its discharge end removably secured thereto as by screws 12. Within the casing there is the conventional dust bag 13, into the interior of which the dust-laden air is drawn.

The cleaner further comprises a fan motor unit which includes a fan 14 and a motor 15. It is to be understood that, except for the mounting

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of the fan motor unit within the casing, it may be of conventional construction so far as the present invention is concerned. The fan 14 includes two rotating fans 16 and a stationary vane assembly 17. A final filter 18 may be carried by the fan, as is common practice. The fan draws air from the filter bag 13 and discharges it through the motor to cool the same, through the left-hand end of the casing and out through the discharge opening 19. It will be apparent that the space 20 on the discharge side of the fan motor unit and the space 21 on the suction side thereof must be separated or sealed from each other to prevent the short-circuiting of air from the discharge to the suction side of the fan motor unit.

The structure for resiliently mounting the fan motor unit and sealing the suction and discharge spaces from each other comprises the mounting and sealing member or unit 21. The latter, in turn, comprises a ring 22 which is of a relatively rigid material, preferably metal such as steel. It is preferably flat or planar. However, at its inner periphery it is provided with a plurality, such as three, of integral flanges 23 extending to one side of the ring and having faces directed radially inwardly. A supporting block 24, made of a suitable resilient material, such as rubber, is bonded or molded to the inner face of each of the flanges 23. The flanges 23 and the supporting block 24 are spaced circumferentially of the ring; for example, equidistantly as shown in Fig. 2. The mounting and sealing member 21 further includes an annular planar thin wall 25, the outer periphery of which is bonded or molded to the side of the ring 22 opposite of the flanges 23. At its inner periphery, the wall 25 is formed with an annular bead 26. Preferably, and as in the illustrated embodiment, the rubber blocks 24 are molded integrally with the annular thin wall 25. Thus, they may be considered as spaced enlargements of the wall. They are shown as disposed entirely on one side of the wall, so that the opposite side adjacent the suction space 21 remains a continuous flat face.

The housing of the motor 14 has a flange 27 formed with an annular groove 28 in which the bead 26 is received. The flange 27 is further provided with three recesses 29 for receiving the rubber supporting blocks 24, the recesses having flange portions 30 on three sides thereof to hold the motor housing against movement, both rotationally and axially, relative to the radially innermost portions of the rubber blocks. The motor is provided with a bearing bracket 31 which supports one bearing of the motor and which is attached to the motor housing by means of screws 32. The flange 27 and the outer peripheral portion of the bearing bracket 31 serve to clamp

the inner periphery of the wall 25, including the bead 26, therebetween.

The casing 10 is provided with a flange 33 extending radially inwardly. This flange may be provided by a separate ring secured to the casing. The ring 22 is adapted to be fastened to the flange 33 by means of screws 35 which extend through notches 34 in the ring 22 into the flange 33. The outer peripheral portion of the rubber wall 25 is thereby clamped between the ring 22 and the flange 33. It will be noted from the drawing that the radially innermost parts of the rigid ring 22 are spaced a substantial distance radially outwardly of the radially outermost part of the motor housing that engages the blocks. Such radial spacing permits the rubber blocks 24 to flex and provide the desired flexibility, both rotationally and axially.

The invention thus provides a structure which may be easily and quickly assembled in a very simple manner. The mounting and sealing member 21 is moved endwise toward the flange 27 of the motor housing, the bead 26 being received in the groove 28 and the rubber blocks 24 in the recesses 29. The bearing bracket 31 is then attached to the motor housing by means of the screws 32 to complete the attachment of the member 21. The two fans 16 are then mounted to the motor shaft and the vane assembly 17 and the final filter 18 are mounted to the bearing bracket 31 in a manner heretofore employed and which forms no part of the present invention. The fan motor unit is then inserted endwise in the casing 10 and mounted therein by inserting the six screws 35 through the notches 34 into the flange 33. The end cap 11 is then attached by means of the screws 12, whereupon the assembly of the fan motor unit is completed. Disassembly may be effected as simply and quickly in the reverse manner.

It will be noted that the fan motor unit is mounted or supported at only one point along its length which, in addition to facilitating and simplifying assembly, provides universal flexibility, that is, flexibility in all directions and minimizes the transmission of vibration and noise to the casing.

The provision of the circumferentially spaced rubber blocks provides adequate and firm support for the fan motor unit while at the same time providing the desired flexibility, as compared, for example, with an annular member of uniform thickness equal to that of the rubber blocks. At the same time, the continuous annular thin wall provides the seal between the suction and discharge spaces. Also, the supporting and sealing elements are combined in a single member to facilitate its assembly.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various other changes and modifications without departing from the spirit thereof.

What I claim is:

1. In air translating apparatus, the combination of a fan motor unit, a casing therefor having an inwardly extending flange, a member for resiliently supporting said fan motor unit within said casing and providing a seal between spaces communicating with the suction and discharge sides of the fan motor unit, said member comprising a ring of relatively rigid material having faces directed radially inwardly at points spaced circumferentially of the ring and an annular planar thin wall of resilient material secured at its inner periphery to said fan motor unit and bonded at its outer periphery to said ring, said thin wall being formed with a plurality of circumferentially spaced enlarged portions molded integrally therewith and held in compression between the outer periphery of the fan motor unit and the inwardly directed faces of said ring, and means for securing said ring to said inwardly extending flange.

2. In air translating apparatus, the combination of a fan motor unit, a casing therefor having an inwardly extending flange, a member for resiliently supporting said fan motor unit within said casing and providing a seal between spaces communicating with the suction and discharge sides of the fan motor unit, said member comprising a ring of relatively rigid material having a plurality of circumferentially spaced flanges extending to one side of the ring, blocks of resilient material bonded to the radially inner faces of said flanges and bearing against said fan motor unit for resiliently supporting the same and an annular thin wall or diaphragm of resilient material bonded at its outer periphery to the opposite side of said ring and formed with a bead at its inner periphery, said bead being clamped to said fan motor unit, and means for attaching said ring to said inwardly extending flange of said casing with the outer peripheral portion of said annular thin wall clamped therebetween.

3. The combination set forth in claim 2 wherein said blocks are integral with said thin wall.

4. In air translation apparatus, the combination of a fan motor unit, a casing therefor having an inwardly extending flange, a member for resiliently supporting said fan motor unit within said casing and providing a seal between spaces communicating with the suction and the discharge side of the fan motor unit, said member comprising a ring of relatively rigid material having a plurality of circumferentially-spaced flanges extending axially from the ring, blocks of resilient material bonded to the radially inner faces of said flanges and bearing against said fan motor unit for resiliently supporting the same, said fan motor unit having surfaces abutting said blocks in circumferential directions to prevent relative rotation between said blocks and said fan motor unit, and an annular thin wall or diaphragm of resilient material integral with said blocks, bonded at its outer periphery to one side of said ring and formed with a bead at its inner periphery, said bead being clamped to said fan motor unit, and means for attaching said ring to said inwardly extending flange of said casing with the outer peripheral portion of said annular thin wall clamped therebetween.

5. Air translation apparatus as set forth in claim 4, wherein the radially innermost part of said rigid ring is spaced a substantial distance radially outwardly of the radially outermost part of said fan motor unit that engages the blocks, whereby said blocks of resilient material may flex to provide the desired flexibility both rotationally and axially.

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