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G. DOIG ET AL

3,478,497

DIRECTIONAL MOUNTING PLATE FOR AIR LINE FILTER

Filed May 14, 1965

FIG. 1

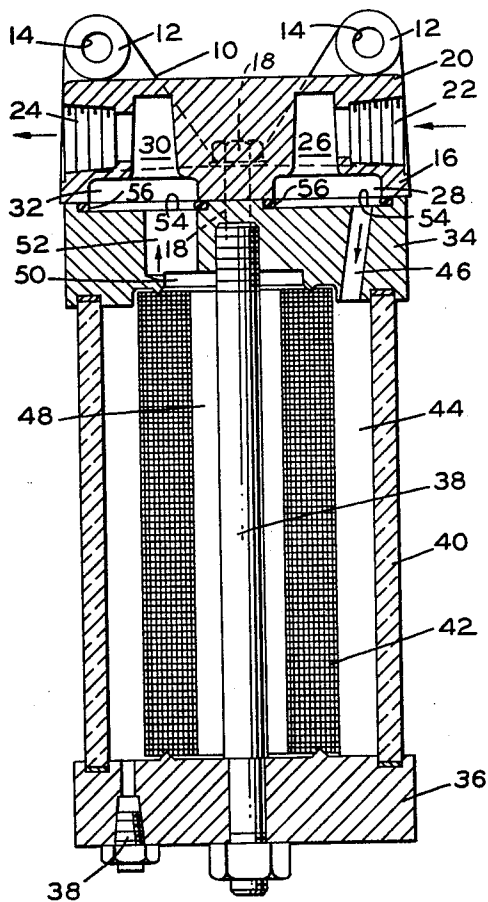


FIG. 2

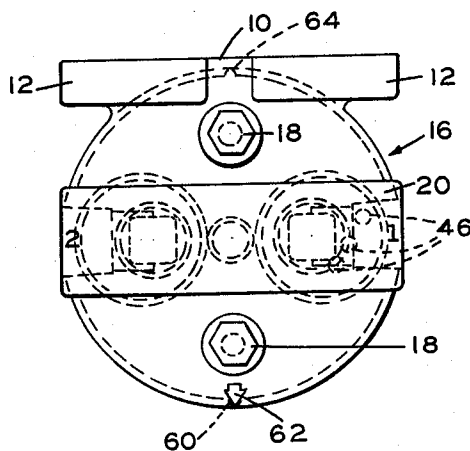


FIG. 3

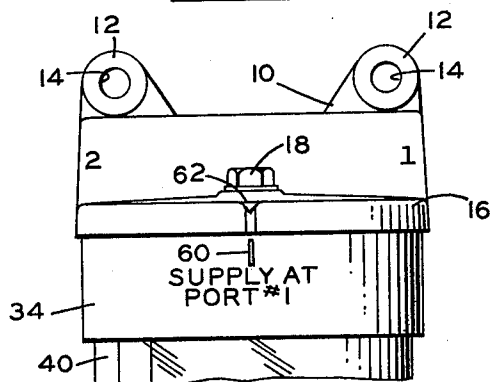


FIG. 4

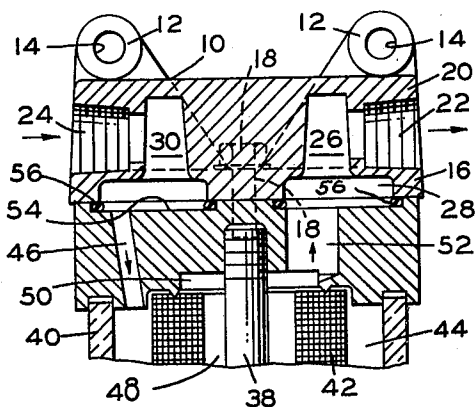
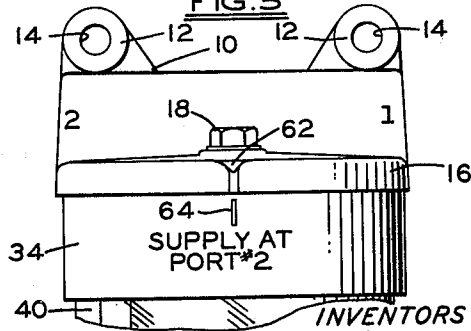


FIG. 5



INVENTORS
GEORGE DOIG
DONALD E. MC GEACHY
BY

Barnes, Kisselle, Kirsch & Choate
ATTORNEYS

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3,478,497 DIRECTIONAL MOUNTING PLATE FOR AIR LINE FILTER

George Doig and Donald E. McGeachy, Highland, Mich.,
assignors to Numatics, Incorporated, Highland, Mich.,
a corporation of Michigan

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1 Claim

ABSTRACT OF THE DISCLOSURE

Improvement in a mounting plate for an air line filter whereby the direction of air flow through the filter is the same regardless of which port of the mounting plate is used as an air inlet for the mounting plate and filter assembly. The porting in the supporting base and the head plate for the filter element is so arranged that a 180° rotation of the head plate relative to the supporting base reverses the air inlet and air outlet of the supporting base so that the proper direction of air flow through the filter element can be maintained regardless of which port in the supporting base is used as the air inlet.

BACKGROUND OF THE INVENTION

This invention relates to improvements in air line filtering assemblies and more particularly to an improved mounting plate in which either port may be used as an air inlet or as an air outlet. In brief, this invention comprises a supporting base and a head plate for a filter element which is rotatably mounted on the support base so that the porting in both the support base and the head plate can be aligned to maintain the same direction of air flow through a filter element regardless of which port in the support base is used as the air inlet.

It has long been a problem in the nematic circuit art, particularly in the construction of nematic circuits on mounting panels or other modules, to arrange the circuit so that an air line filter can be conveniently placed in the circuit. Typically, the physical arrangement of the components of the circuit is such that the air inlet and outlet lines must cross each other in order to be positioned so that they can be connected to the inlet and outlet port of the mounting plate of the air line filter. This invention alleviates this problem by providing a mounting plate structure in which each of the ports can serve either as an air inlet or an outlet, thereby making it unnecessary for the air lines of the circuit to cross each other. While there are many control valves which use the misalignment of ports in a plate to control the volumetric flow through the valve, the inventor of this device knows of no prior art reference which discloses an arrangement of ports for maintaining the same direction of air flow through a filter element while utilizing either port of the supporting base as the air inlet for the filter element.

This invention relates to a directional mounting plate for an air line filter.

Particularly in pneumatic circuits, it is desirable to have an air filter for removal of moisture, dirt particles and oil from air used in control circuits. It is an object of the present invention to provide a mounting device for an air filter assembly which can be utilized to alter the direction of air through the filter assembly simply by switching the filter assembly on the mount in a 180° motion. Thus, the common mount becomes a versatile plate for use in a mounting panel or other circuit so that in whichever direction the air can be conveniently transmitted through the mounting plate, the filter can be applied to accept it.

Other objects and features of the invention relating to details of construction and operation will be apparent in the following description and claims.

Drawings accompany the disclosure and the various views thereof may be briefly described as:

FIGURE 1, a sectional view of the composite mounting and filter assembly.

FIGURE 2, a top view of the assembly.

FIGURE 3, an outside elevation of the portion of the device showing the relationship.

FIGURE 4, a sectional view similar to FIGURE 1, showing the housing rotated 180°.

FIGURE 5, a view similar to FIGURE 3 showing one of the parts rotated to a second selected position.

In the drawings:

In FIGURE 1, a panel mounting plate 10 has two ears 12 drilled at 14 to receive mounting bolts. The plate 10 has projecting perpendicular thereto a circular head portion 16 having, therein, downwardly extending captive hexagonal head screws 18. Transverse and atop the circular head 16 is an integral block portion 20 shown in section in FIGURE 1 with a tapped port 22 at one side and a tapped port 24 at the other side. The port 22 leads to a vertical passage 26 which expands into a circular recess 28 in the bottom surface of the plate 16. Similarly, the port 24 leads to a passage 30 which expands downwardly into a circular recess 32.

Supported on the plate 16 by screws 18 is a filter head plate 34 which forms one end of a filter assembly completed by a second filter head 36, a tie-rod 38, and a transparent annular housing member 40. The filter cartridge 42 is interposed between and supported on annular sharp ridges on the head 34 and the head 36. A suitable drain valve 38 is provided in head 36. The filter assembly has an outer inlet chamber 44 outside the filter cartridge 42 which is connected by passages 46 to the recess 28 and the opening 22. The interior outlet chamber 48 within the cartridge 42 is connected to a short bore 50 which joins a passage 52 which registers with the recess 32. In the surface of plate 34 are circular recesses 54 in each of which is an O-ring 56 which seals against the surface of plate 16. If port 22 is designated as port 1, as shown in FIGURE 1, as shown in FIGURE 2, the air inlet will pass through passages 26 and 46 to outer chamber 44 where it will flow through the filter cartridge 42 and out the passage 52, 30 and 24. The outside of the head 34 is provided with indicia as shown in FIGURE 3 at 60 so that when the mark 60 is adjacent an arrow 62, shown in FIGURE 2, the supply can be at port 1 designated as 22 in FIGURE 1 and the outlet will then be at port 24. On the other hand, if the head 34 is rotated 180° so that the indicia 2 at 64 in FIGURE 5 lies adjacent the arrow 62, then the sectional view will be as shown in FIGURE 4, so that the air inlet can be through port 24 as shown in FIGURE 4 and out at 22.

Thus, by the simple extent of rotating the head 34 to a proper registering position with the indicia, the outlet can be switched from one side of the mounting plate to the other. The passages 46 extending to inlet chamber 44 are spaced radially outward of the center of head 34 and register with the outer portions of chamber 28. The outlet 52 is spaced radially inward and registers with the inner portion of chamber 28. These passages are preferably axially disposed to allow free flow of the air into and out of the air filter. By providing the manifold openings 28 and 32 in plate 16, this flow may be maintained regardless of the selected position of the head 34 on the plate 16. Thus, in each case, the filter may function as designed with flow into the outer chamber 44 and out of the inner chamber 48.

What is claimed as new is as follows:

1. A filter mounting for a cylindrical air filter which comprises:

- (a) a filter unit having a head plate bearing on one end a cylindrical air filter and having inlet and outlet first passages terminating in locations diametrically opposed to one another in a mounting face and initiating at locations spaced radially respectively near and away from the axis of the filter such that said initiating locations respectively fluidly communicate with the space encompassed by said cylindrical filter and the space exterior of said cylindrical filter, a casing on said head plate surrounding and enclosing said air filter such that both of said initiating locations of said passages fluidly communicate with the space encompassed by said casing with both said filter and said casing attached to and carried by said head plate, and (b) a support base carrying said filter unit, said support base being constructed and arranged so that said filter unit can be manually rotated through 180° with respect to said base from the exterior of said filter unit by rotating said filter unit as a whole, said base having spaced apart port openings which each serve selectively as an inlet or an outlet for air, said base further having a mounting surface mounted directly adjacent and contiguous with the mounting face of said head plate, said base having a pair of second passages each communicating respectively with one of said port openings and terminating in spaced apart openings which are diametrically opposed to one another in said base mounting surface, each of

said openings in said base mounting surface spanning radially at least the distance between the radially innermost edges of the radially innermost of said first passages and the radially outermost edge of the radially outermost of said first passages at said mounting face of said head plate such that a unidirectional flow of air into the filter unit, through the filter, and out of the filter unit can be effectuated regardless of which of said port openings of said base serve as an air inlet, whereby mounting said filter head plate on said supporting base in one of two positions rotated 180° from each other permits either of said port openings to serve as an air inlet and the other to serve as an air outlet.

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HARRY B. THORNTON, Primary Examiner

D. E. TALBERT, Jr., Assistant Examiner

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