

[54] PCV VALVE FILTER

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55/498

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[58] Field of Search 123/119 B, 41.86; 55/498,
55/504, 509; 210/440, 443

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[57] ABSTRACT

A PCV valve filter is provided that includes a means for mounting the filter between an engine crank case and a PCV valve. There is provided for the filter a housing and cover as well as a cartridge that can be removed and replaced when desired.

1 Claim, 5 Drawing Figures

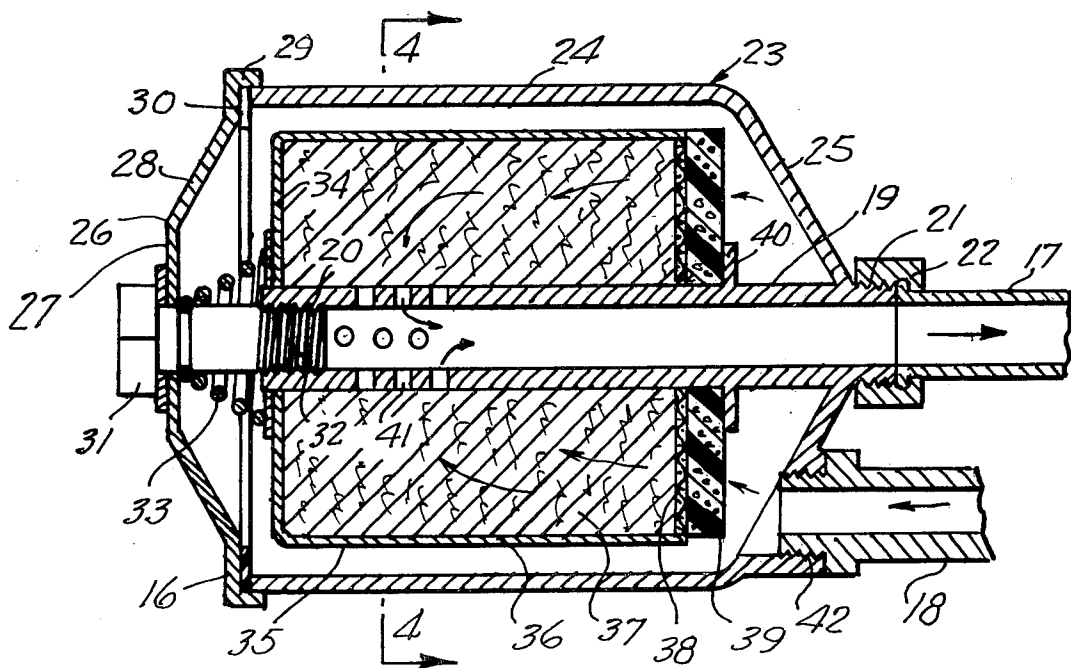


FIG. 1.

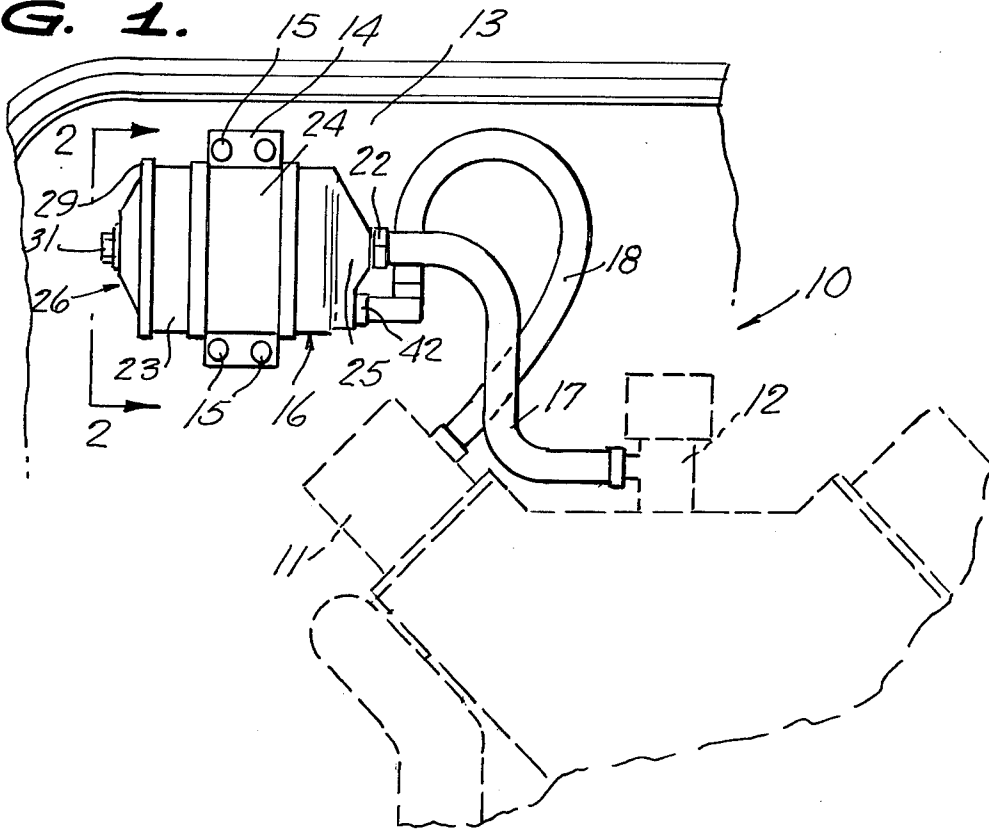


FIG. 2.

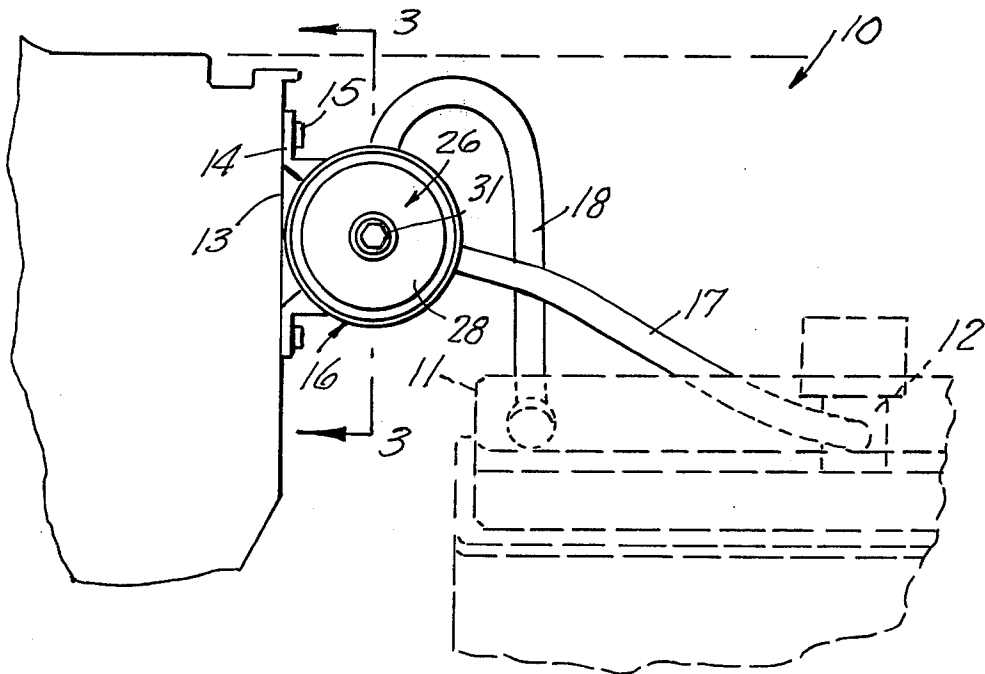


FIG. 3.

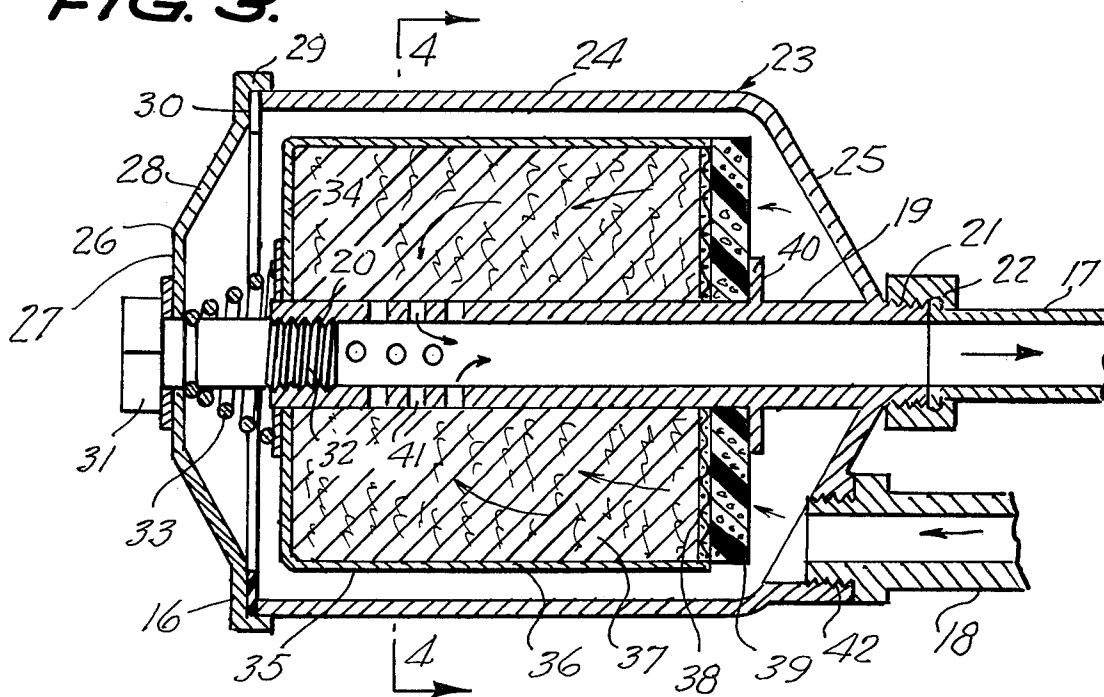


FIG. 4.

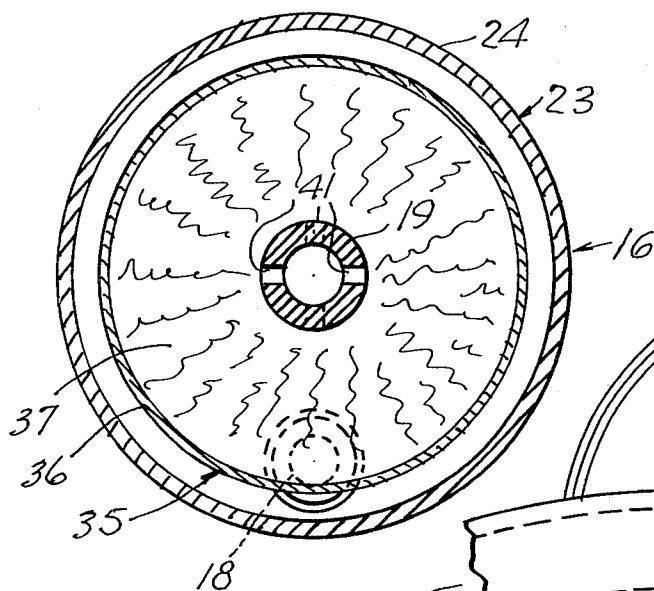
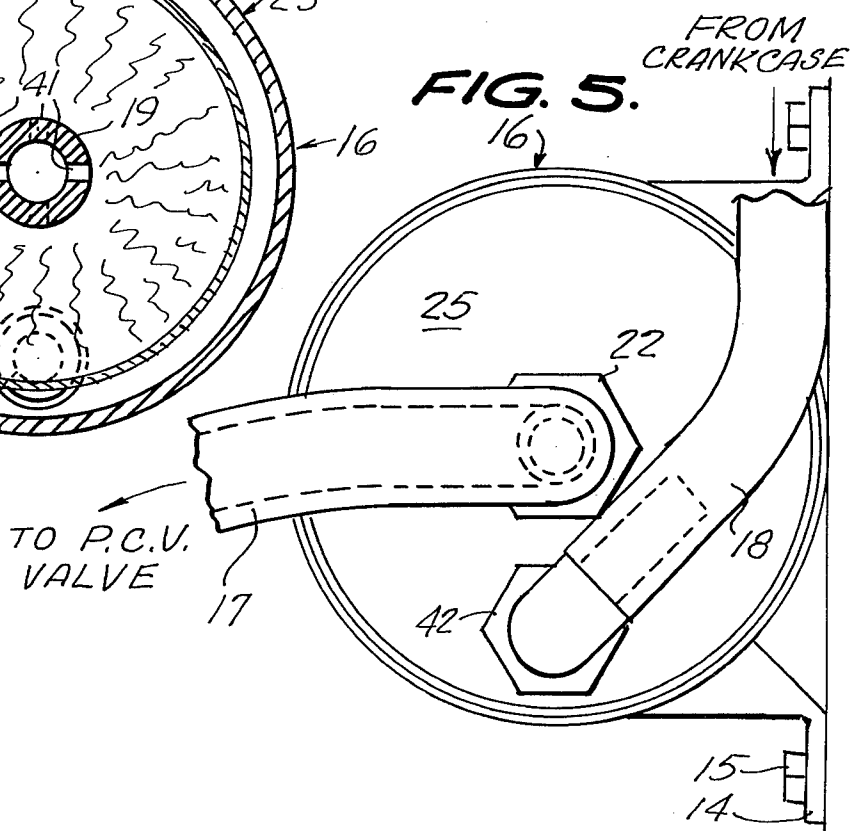


FIG. 5.



PCV VALVE FILTER

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to internal combustion engines such as automobile engines, and more particularly to a PCV valve filter for such an engine.

2. Summary of the Invention

A PCV valve filter is provided that helps to keep a motor or engine clean by removing foreign matter as well as eliminating considerable wear on various motor parts. In addition, the PCV valve filter provides for smoother operation so that the engine will need fewer tuneups, and wherein the filter prevents the PCV valve from getting dirty so that it is not necessary to change the PCV valve.

The primary object of the present invention is to provide a PCV valve filter that will assure that clean air enters the PCV valve.

Still another object of the present invention is to provide a PCV valve filter that is rugged in structure and efficient in use and is relatively simple and inexpensive to manufacture.

Other objects and advantages will become apparent in the following specification when considered in the light of the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is an elevational view illustrating the PCV valve filter of the present invention;

FIG. 2 is a sectional view generally taken on the line 2—2 of FIG. 1;

FIG. 3 is a sectional view on an enlarged scale taken on the line 3—3 of FIG. 2;

FIG. 4 is a sectional view taken on the line 4—4 of FIG. 3; and

FIG. 5 is a view illustrating the connections to the crankcase and PCV valve.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now in detail to the drawings, the numeral 10 indicates a portion of a conventional internal combustion engine such as the engine of a vehicle and wherein the numeral 11 indicates in FIG. 1 the portion of the engine leading to the crankcase. In FIG. 2, the numeral 12 indicates the PCV valve. Also in the drawings the numeral 13 indicates a support or well portion of the engine body.

As shown in the drawing, a bracket 14 is secured to the well portion 13 in any suitable manner as, for example, by means of securing elements 15. In accordance with the present invention, there is provided a PCV valve filter that is indicated generally by the numeral 16, and the numeral 17 indicates a hose or line that connects the filter 16 to the PCV valve 12, while the numeral 18 indicates a line or hose that connects the filter 16 to the crankcase 11.

As shown in the drawing, the filter 16 includes a hollow tubular stem 19 that has an internally threaded portion 20 on one end thereof, FIG. 3, and the opposite end of the stem 19 is threaded externally as at 21. The numeral 22 indicates a coupling that serves to connect the hose 17 to the threaded end portion 21 of the stem 19.

The filter assembly 16 includes a hollow housing that is indicated generally by the numeral 23, and as shown

in the drawings, the housing 23 includes a cylindrical wall portion or section 24 as well as a tapered end portion 25. The numeral 26 indicates a detachable or removable cover for the housing 23, and the cover 26 includes a central portion 27 as well as an inclined portion 28 and an outer flanged portion 29, there being a gasket or washer 30 interposed between the flange portion 29 and the adjacent portion of the housing 23 as shown in FIG. 3.

The numeral 31 indicates a securing element that is in the form of a short bolt that has a threaded end portion 32 that is arranged in threaded engagement with the threaded portion 20 of the stem 19. The numeral 33 indicates a spring member or coil spring that is circumposed on the bolt 31 and the spring 33 abuts a washer or retainer 34 that is arranged as shown in the drawings.

Arranged within the housing 23 is a cartridge 35 that includes an outer casing or section 36 that has filter material 37 arranged therein, and the numeral 38 indicates an end portion of the cartridge 35 that abuts or engages a resilient washer or stop member 39. The member 39 is arranged contiguous to a disc or retainer 40 that is secured to or formed integral with the stem 19. As shown in FIGS. 3 and 4, for example, the stem 19 is provided with a plurality of apertures or openings 41 therein for a purpose to be later described. The numeral 42 indicates a fitting for operatively connecting the hose 18 to the housing 23.

From the foregoing, it will be seen that there has been provided a PCV valve filter, and in use with the parts arranged as shown in the drawings, the filter 16 of the present invention is adapted to be mounted in a suitable location as, for example, the filter can be mounted on the wall 13 by means of the brackets 14. The hose 17 connects the filter 16 to the PCV valve 12, and the hose 18 connects the crankcase 11 to the filter 16 as previously noted. With the filter arranged in this manner, it will be seen that the motor will be kept clean since the material entering the PCV valve will be free of foreign matter and the like.

The parts can be made of any suitable material and in different shapes or sizes as desired or required.

It will thus be seen that there has been provided a PCV valve filter that is constructed so that the filter can be renewed without involving the PCV (positive crankcase ventilation) valve.

Some of the advantages of the present invention are as follows: The device keeps the motor exceptionally clean, removes sledge, eliminates considerable wear on various motor parts, affords much smoother operation and needs fewer tuneups. In addition, the PCV valve never gets dirty or requires changing.

When first installed on a used vehicle, it should be changed approximately every two or three months, depending on how dirty the engine is. Afterwards, twice a year or even once a year should be sufficient.

As shown in the drawings, the device may be mounted inside the far wall beside the motor. The numeral 18 indicates the inlet from the motor crankcase, while the numeral 17 indicates the outlet to the PCV valve. The numeral 14 indicates the mounting bracket.

There is further provided a cover 26 for the cannister which is normally held on by bolts after first placing a gasket thereon. A short threaded bolt 31 also normally extends down through the center of the cover with the head on the outside. The threads on this bolt 31 are

adapted to screw into the inside of the stem 19. There is further provided a short spring 33 that may be mounted on the bolt 31. The spring is adapted to be shaped so that a portion of it snaps into an indentation around the circumference so that it cannot fall off. The cartridges or filters themselves may be of conventional construction and may be of the type that have the exterior covered with a material resembling cheesecloth, and the cartridges may have a small wire bail for easy removability.

The openings or holes 41 are adapted to be drilled completely through both side walls of the stem 19 and these holes 41 are near the top of the stem but underneath the threaded portion 20, and these holes permit the clean air to enter the PCV valve. The stem 19 is hollow all the way through. The circular washer may be permanently attached to the bottom of the stem or pipe, as shown in the drawings. Similarly, a neoprene washer may have a hole cut in its center and can be pushed down over the stem and rest on the circular washer and this construction forces the air to pass through the cartridge and not around the cartridge.

Having thus described the preferred embodiment of the invention, it should be understood that numerous

structural modifications and adaptations may be resorted to without departing from the spirit of the invention.

What is claimed is:

- 5 1. A PCV valve filter for internal combustion engines of the type which include a crankcase, an intake manifold and a PCV valve connecting said crankcase to said intake manifold for venting the fumes from the intake manifold comprising a hollow stem having an internally
- 10 threaded end portion and an externally threaded opposite end portion, a housing secured on said stem and having said stem extending therethrough, a cover mounted on said housing, a securing element extending through said cover and engaging the internally
- 15 threaded end portion of said stem, said stem having a plurality of openings therein, a filter material cartridge arranged in said housing surrounding said stem, resilient means mounted on said securing element adjacent
- 20 said cover for supporting said cartridge in position on said stem, a mounting bracket securing said housing to said engine and a pair of hoses detachably secured to said housing and connected between said PCV valve and said crankcase.

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