



(12) **EUROPEAN PATENT APPLICATION**

(21) Application number : **92850169.1**

(51) Int. Cl.⁵ : **F02M 35/10**

(22) Date of filing : **07.07.92**

(30) Priority : **08.07.91 SE 9102124**

(43) Date of publication of application :
13.01.93 Bulletin 93/02

(84) Designated Contracting States :
AT BE CH DE ES FR GB IT LI NL

(71) Applicant : **AB VOLVO**
Assar Gabrielssons väg Torslanda
S-405 08 Göteborg (SE)

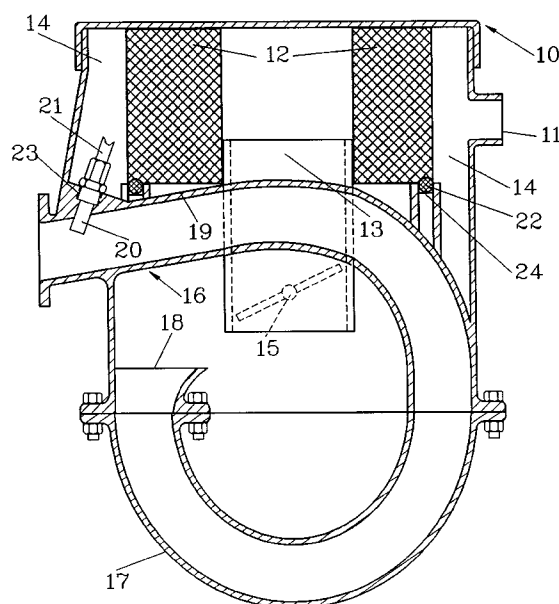
(72) Inventor : **Karlsson, Jan**
Nordfjällsvägen 5
S-421 66 Västra Frölunda (SE)
Inventor : **Dahlgren, Jan**
Räntmästaregatan 26A
S-416 58 Göteborg (SE)
Inventor : **Tyllström, Erling**
Basunvägen 7
S-434 47 Kungsbacka (SE)

(74) Representative : **Roth, Ernst Adolf Michael et al**
GÖTEBORGS PATENTBYRA AB Box 5005
S-402 21 Göteborg (SE)

(54) **Intake system for internal combustion engines.**

(57) An intake system for internal combustion engines incorporating a filter housing (10) with an air intake opening (11), a filter element (12) and at least one air outlet tube (13), which communicates with the engine inlet manifolds (16), which form an integral unit with the bottom part of the filter housing (10). The top part (19) of the inlet manifolds (16) are designed to form the lowermost border of the filter housing (10), and to provide a support for the filter element (12). Hereby is obtained a compact and space-saving construction.

FIG. 1



Technical field

The present invention relates to an intake system for internal combustion engines and including a filter housing with an air intake opening, a filter element and at least an air outlet tube, as seen in the flow direction of the air, and which air outlet tube is arranged to communicate with the engine inlet manifolds, which form an integral unit with the bottom part of the filter housing.

Background of the invention

All internal combustion engines have an air cleaner for the engine air intake. The main function of the air cleaner is to keep away dust and other particles from the carburettor and the cylinders. The air filter prevents dust or dirt from blocking jets and causing wear on pistons and cylinders. The cleaner also functions as silencer, as it muffles the intake noise from the carburettor and the air cleaner housing suppresses the resonance which occurs due to the air pressure variations in the inlet manifolds.

The object and most important features of the invention

The object of the present invention is to provide an intake system of the type mentioned in the introduction, which exhibits a compact and space-saving construction. According to the invention this has been achieved in that the top part of the inlet manifolds are designed to form the lowermost border of the filter housing and to provide a support for the filter element.

Description of the drawings

Hereinafter the invention will be further described with reference to an embodiment shown in the enclosed drawings.

Fig. 1 discloses a section through the intake system.

Fig. 2 discloses in a perspective the intake system according to the invention without filter, and without fuel injection valve.

Description of embodiment

The intake system according to fig. 1 incorporates a filter housing 10 with an air intake 11, a filter element 12 and at least one air outlet tube 13. The filter housing 10 encases the replaceable, tubular filter element 12. The air intake 11 is placed at one gable of the filter housing 10, whereas the outlet tube 13 is connected to the tubular opening of the filter element 12. From the air intake 11 the air is led via an air space 14 extending around the filter element, through the filter element 12 and to the air outlet tube.

The outlet tube 13 comprises a throttle valve 15 and ends into a common space from where the induction air is distributed to the inlet manifold 16 of the different engine cylinders. The inlet part 17 of these inlet manifolds 16 is horn-shaped and has an inlet opening 18, which communicates with the outlet tube 13, from where the induction air is led on to the inlet manifold 16 via an air room in the horn 17. The inlet manifold 16 has an upper mainly plane portion 19, against which a part of the filter housing 10 connects and it thus forms a part of its lower border. A very compact and space-saving construction is hereby achieved.

In fig. 2 is shown an intake system for a six cylinder engine, having one inlet manifold 16 each. The outlet tube 13 from the filter housing 10 is centrally located and the air is distributed from this point to all six inlet manifolds 16. Thus the filter element 12 (not shown) is positioned direct on the package forming the intake system, whereby the upper mainly planar portion 19 of the inlet manifolds 16 form the bottom of the filter housing. The portion 19 of the inlet manifolds 16 connecting to the filter housing 10 are curved but may also be planar, the filter housing thereby being given a corresponding shape. The filter element 12 itself is positioned against a sealing ring 22 in a groove 24, which has a shape corresponding to the cross section of the filter element, which in the example shown is oval.

Fuel is supplied to the outlet part of the inlet manifold 16 via a fuel injection valve 20, which is screwed into a threaded bore 23 at the upper part of the inlet manifold 16, near its outlet opening. The fuel pipe 21 of the injection valve is positioned to a part of its length in the air space 14 of the filter housing 10, which air space communicates with the air intake 11. Hereby is achieved a cooling of the fuel supplied. Alternatively the fuel supply pipe can be embedded and form a unit with the inlet manifold 16 and also in this case a part of the fuel pipe can be placed into the air space 14 of the filter housing 10.

The invention is of course not limited to the embodiment shown but several variants are conceivable within the scope of the claims.

Claims

1. Intake system for internal combustion engines and comprising a filter housing (10) with an air intake opening (11), a filter element (12) and at least one air outlet tube (13) as seen in the flow direction of the air, said air outlet tube being arranged to communicate with the engine inlet manifolds (16), which form an integral unit with the bottom part of the filter housing (10), **characterized therein**, that the top part (19) of the inlet manifolds (16) are designed to form the lowermost border of the fil-

ter housing (10), and to provide a support for the filter element (12).

2. Intake system as claimed in claim 1,
characterized therein, 5
that the filter element (12) is positioned inside a seal (22) provided on the top part of the inlet manifolds (16).
3. Intake system as claimed in claim 1, 10
characterized therein,
that the inlet part (17) of the inlet manifold (16) is horn-shaped, forming an air space inside the horn, which space communicates partly with the outlet tube (13) as well as with the inlet manifolds 15
(16).

20

25

30

35

40

45

50

55

FIG. 1

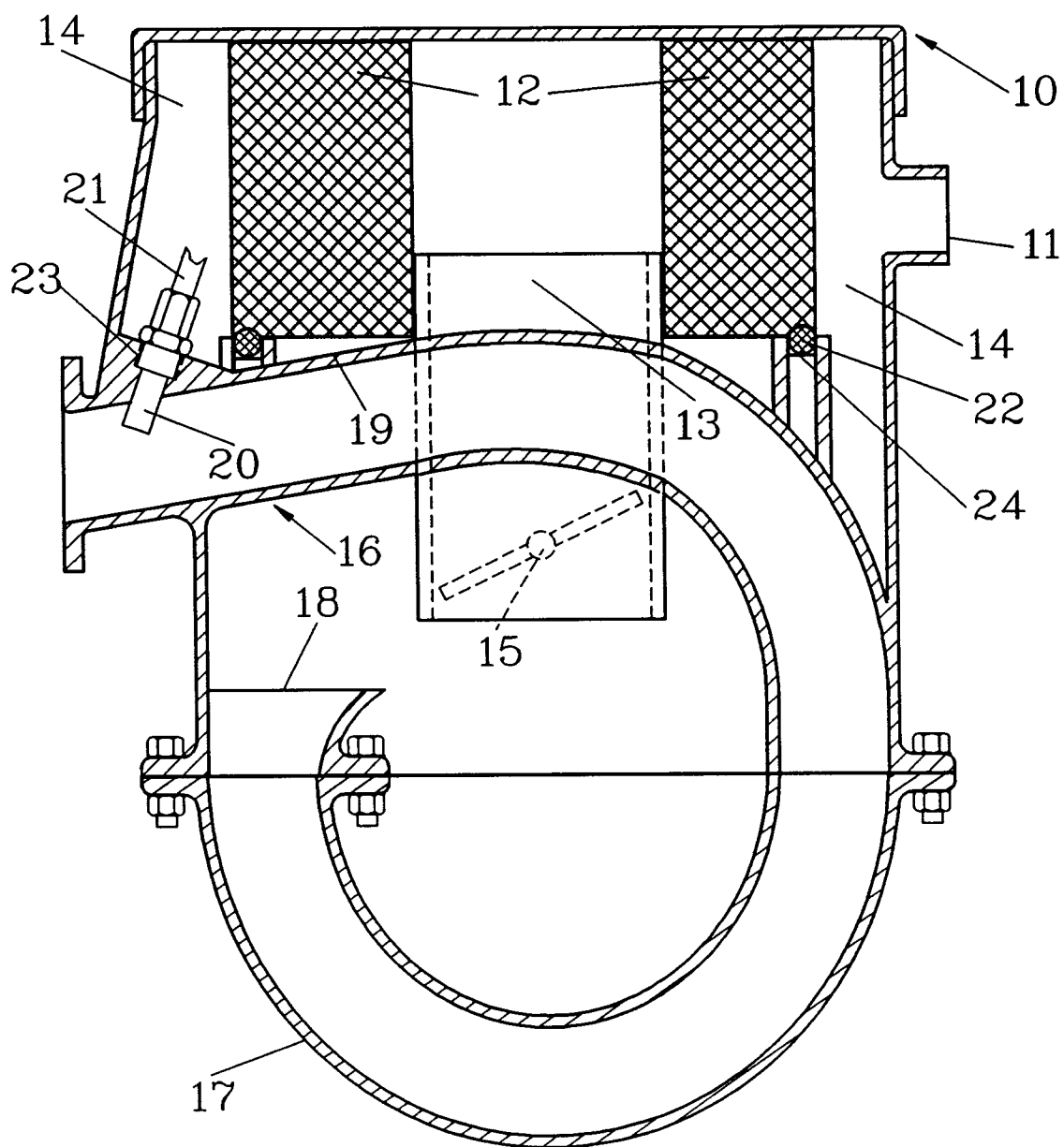


FIG. 2

