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(58) Field of search

B1D

B1T

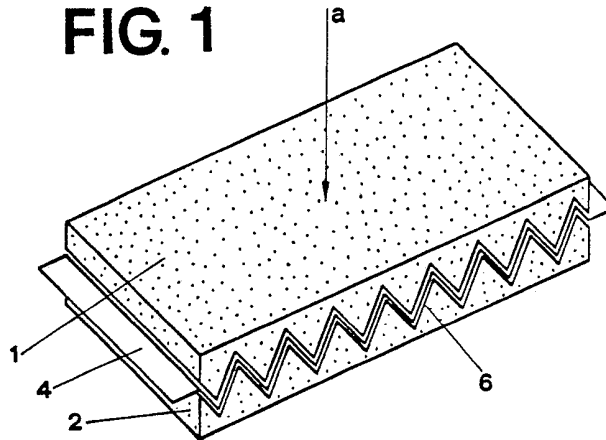
Selected US specifications from IPC sub-class

B01D

(54) Air filter

(57) A filter for air introduced into a motor vehicle cabin comprises respective coarse and fine-pored layers 1, 2 of resilient foamed polypropylene, presenting mating corrugated surfaces between which is sandwiched a fine mesh filter cloth 4. Layers may be coloured to indicate pore size. The filter may be sprinkled with active carbon.

FIG. 1



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FIG. 1

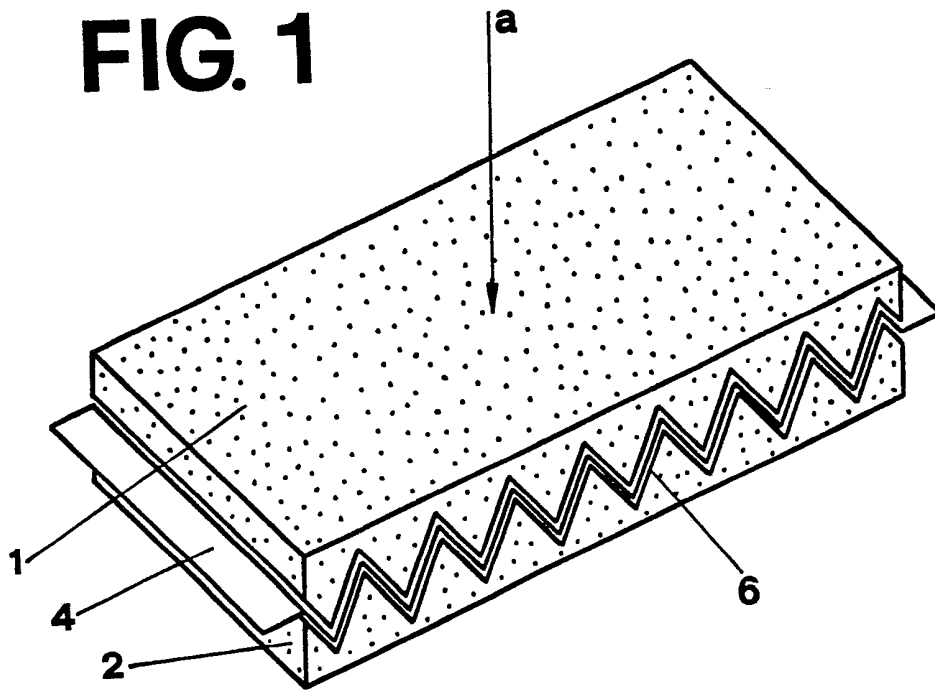
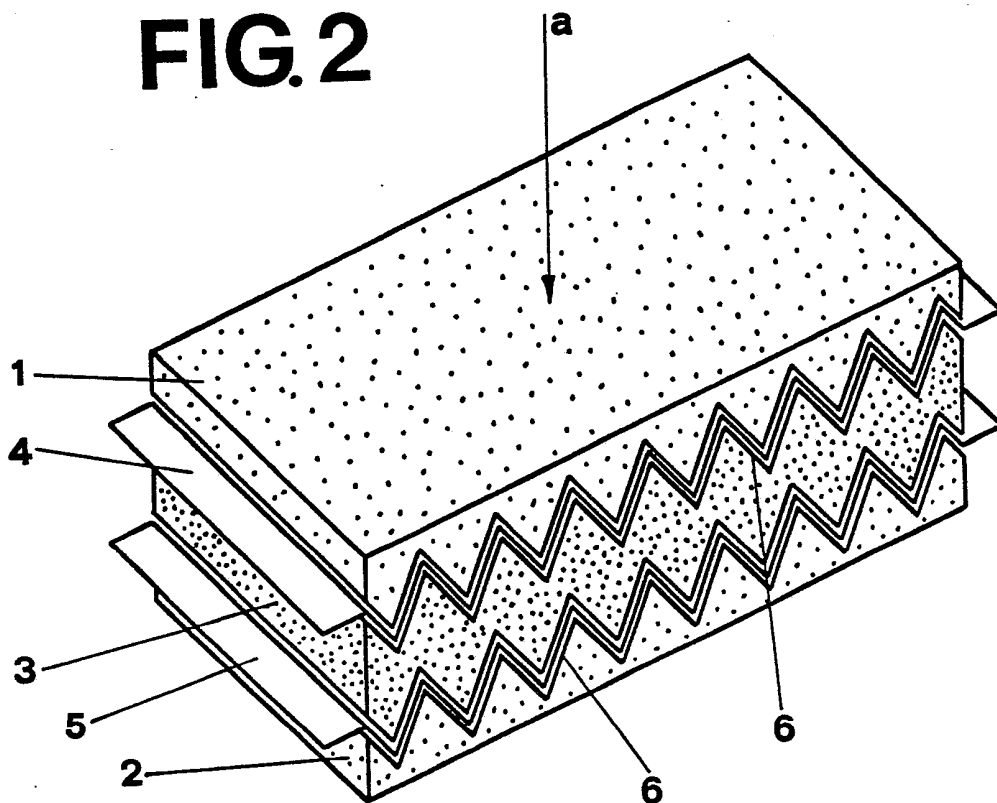


FIG. 2



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Title:

FILTER FOR FILTERING THE AIR
INTRODUCED INTO THE INTERIOR OF
A MOTOR VEHICLE.

This invention relates to a filter for filtering the air introduced into the interior of a motor vehicle.

The ventilation of or the supply of fresh air to the interior of motor vehicles is generally effected by means of the ventilating system, the outside air frequently being drawn in by switching on the blower and being blown into the interior either directly or after flowing through the cooling unit of an air-conditioning unit. In this case, it is a disadvantage that the fresh air is blown unfiltered, that is to say laden with road dust and harmful substances, through the ventilating nozzles, into the faces of the occupants of the car. This is understandably felt to be disturbing and unpleasant and leads to the fact that the ventilation is switched off, particularly on busy roads, in order to avoid the inconvenience.

The present invention aims to provide a simple and inexpensive filter by means of which the air introduced into the interior of motor vehicles can be filtered.

Accordingly, the present invention provides a filter for filtering the air introduced into the interior of a motor vehicle, the filter comprising air-permeable foamed filter material.

The filter material may appropriately consist of resilient foamed material and the filter desirably takes the form of a block consisting of at least one layer of filter material. A plurality of layers of filter material may be provided and a cloth-like fine-mesh filter may be inserted between adjacent layers of filter material. In this case, it is preferable for the adjacent surfaces of the layers of filter material to be corrugated in

zig-zag form. This provides a non-slip connection between the layers of filter material, in a simple manner, and in addition produces a much larger effective area of the cloth-like fine-mesh filter situated in between.

5 The filter material may be coarse-pored or fine-pored or may consist of at least one layer of coarse-pored filter material and of at least one-layer of fine-pored filter material. In this case, the various layer elements may have different colours for the easy recognition

10 of the pore size of a filter-material element. In addition, the filter may be provided, for example sprinkled, with activated carbon.

It is optimum from the filtering point of view for the filter to consist exclusively of air-permeable components,

15 so as not to cause any rattling noises and in addition even to have a sound-damping effect. The filter block can be introduced easily and be taken out again for cleaning or replacement. It is also a particular advantage that the filter block can be cut to size according to

20 the different sizes of the air-intake housing of the motor vehicle. Finally, the filter can be adapted in a simple manner, individually, to different driving performances and environmental conditions, in that only one or more layers of filter material can be used. The

25 fine-mesh filter may also be omitted.

The invention will now be further described, by way of example, with reference to the drawings, in which:-

Figure 1 is a perspective view of one embodiment of a filter according to the invention having two layers

30 of foamed filter material and one fine-mesh filter situated in between; and

Figure 2 is a perspective view of a second embodiment of a filter according to the invention having three layers of foamed filter material with two fine-mesh filters situated in between each of them.

5 In the drawings, like parts are denoted by like reference numerals.

Referring first to Fig.1 of the drawings, the filter comprises layers 1 and 2 of filter material each having a plane outer surface and a corrugated inner surface
10 6. The surfaces 6 are corrugated in zig-zag form and lie against one another with a cloth-like fine-mesh filter 4 inserted in between. The layers 1 and 2 of filter material are identical in their external shape and fit seamlessly into one another if one layer is
15 turned through 180° in relation to the other.

In the second embodiment shown in Fig.2 of the drawings, a third layer 3 of filter material additionally lies between the two layers 1 and 2 of filter material. This third layer is corrugated in zig-zag form at both sides
20 in order to fit between the surfaces 6 of the layers 1 and 2 of filter material. Two fine-mesh filters 4 and 5 are inserted respectively between the corrugated surface 6 of the layer 1 and the corrugated surface 6 of the layer 2.

25 The air intake is effected in the direction of the arrow a in both examples.

The layers 1, 2, 3 of filter material may be selected so that the air first flows through a coarse-pored layer and finally leaves the filter again from a fine-pored
30 layer.

The angles of the zig-zag-shaped corrugations on the surfaces 6 of the layers 1, 2, 3 of filter material may be of different steepness. The effective filter area of the fine-mesh filter 4 or 4 and 5 folded into 5 the surface corrugations 6 varies accordingly.

As a result of the resilient construction of the filter and also of the possibility of being able to dress the filter appropriately, the majority of motor vehicles can be equipped easily and inexpensively with an air 10 filter, even after manufacture of the vehicle.

The foamed material of the layers 1, 2 and 3 may consist of any suitable filter material although polypropylene is preferred.

CLAIMS

1. A filter for filtering the air introduced into the interior of a motor vehicle, the filter comprising air-permeable foamed filter material.
2. A filter according to claim 1, wherein the filter material consists of resilient foamed material.
3. A filter according to claim 1 or claim 2, wherein the filter comprises a block consisting of at least one layer of filter material.
4. A filter according to claim 3, wherein the filter comprises a plurality of layers of filter material and wherein a cloth-like fine-mesh filter is inserted between adjacent layers of filter material.
5. A filter according to claim 4, wherein the facing surfaces of said layers of filter material are corrugated in zig-zag form.
6. A filter according to any preceding claim, wherein said filter is provided with activated carbon.
7. A filter according to claim 6, wherein the activated carbon is sprinkled on the filter.
8. A filter according to any preceding claim, wherein the filter material is coarse-pored or fine-pored or consists of at least one layer of coarse-pored filter material and of at least one layer of fine-pored filter material.

9. A filter according to claim 8, wherein the various layers of filter material have different colours for the easy recognition of the pore size of each layer of filter material.

10. A filter according to any preceding claim, wherein the filter material consists of polypropylene.

11. A filter substantially as described herein with reference to Fig. 1 or Fig.2 of the drawings.