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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 6 : B01D 46/52, 27/06, 27/35	A1	(11) International Publication Number: WO 97/38782
		(43) International Publication Date: 23 October 1997 (23.10.97)

(21) International Application Number: PCT/SE97/00644

(22) International Filing Date: 16 April 1997 (16.04.97)

(30) Priority Data:
9601435-2 16 April 1996 (16.04.96) SE

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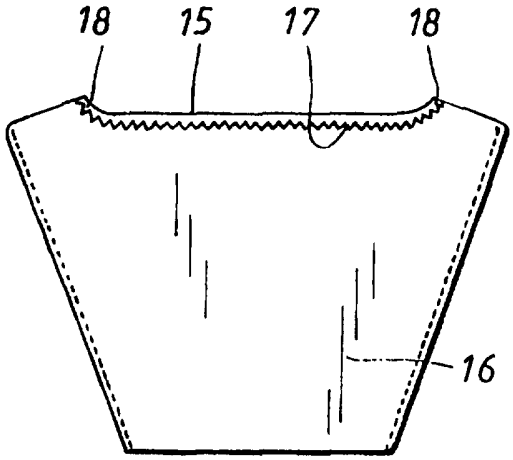
(81) Designated States: AU, NO, US, European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE).

Published
With international search report.
In English translation (filed in Swedish).

(54) Title: FILTER WITH MOUNTING FRAME AND MOUNTING DEVICES

(57) Abstract

The invention relates to a device in air filter cartridges of so-called bag filter type. By means of making recesses (15) in the short sides of the respective filter blanks, before sewing, a seam line/supporting line (17) is obtained which is lower than the corner side portions (18) of the filter blank (16). In this way, the pressure/tensile load may be distributed over the entire area at the entrance of the air filter cartridge by means of a wire grating inserted in the cartridge frame.



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TITLE:
FILTER WITH MOUNTING FRAME AND MOUNTING DEVICES

TECHNICAL FIELD:

The present invention relates to a device in air filter cartridges of so-called bag filter type where, in connection with so-called closed cycle thinking, it is desired to sort parts from the filter cartridge at source and reuse them.

BACKGROUND OF THE INVENTION:

Air filter cartridges are previously known, and normally comprise some kind of frame unit which sometimes, for stiffening purposes, is provided with a wire grating. In these earlier air filter cartridges the filter medium is fully supported by the attachment which has been applied between the frame sides and the filter medium. The sides of attachment frame/filter may for instance be sheet metal strips and/or metal staples, but typically the attachment must be arranged along the entire length of the frame side portions. The reason why the frame attachment must be done so properly is that the entire pressure (tensile load) at the entrance of the filter cartridge is received at the edge attachment.

SUMMARY OF THE INVENTION:

The object of the invention is to be able to mount or detach such a filter medium unit as described above, so that cartridge change, inclusive sorting at source, functions in a simple way in practice. This is achieved by means of a device according to claim 1.

BRIEF DESCRIPTION OF THE DRAWINGS:

In the following, the invention will be described in greater detail with reference to the attached drawings, in which

Fig. 1 is a perspective view of a complete air filter cartridge,

Fig. 2 is a front view of a frame/grating unit,

Fig. 3 is a sectional view of the air filter cartridge,

Fig. 4 shows a blank for a cartridge part,

Fig. 5 shows the same blank folded and sewn up,

Fig. 6 shows a partial perspective view of a portion of filter media plus several grating wires,

Fig. 7 is a perspective view of filter media according to a second embodiment,

Fig. 8 shows the first step when mounting filter media according to the second embodiment, and

Figs. 9 and 10 are further views showing the mounting of filter media into a frame.

PREFERRED EMBODIMENTS:

The present invention is intended to provide an air filter cartridge 10, wherein the pressure/tensile load, caused by air flowing there through, is distributed over a larger area at the entrance 11 within the outer edge of the filter.

This pressure distribution is achieved by means of allowing the filter medium 12 to be supported by a wire grating 14, inserted into the frame 13. Because of this, no attachment of the filter edges has to be arranged along the entire length of the frame side portions. Sealing is obtained by means of placing a so-called foam seal in the frame side portions and this seal only has to be fixed at one or a few points.

Recesses 15 are made at the short sides of the respective filter part 16, in order to ensure that the supporting forces do end up on the grating 14 and its parts. In this way, the seam line/supporting line 17 will be situated lower than the corner side portions 18, and will therefore, for natural reasons, be the lines where the pressure forces are received.

By means of letting the grating be a carrier of the filter medium, a situation is achieved in which the tensile load will not burden the outer periphery/frame attachment, but instead the grating and the entire area of the entrance.

The filter medium 12 may, according to what is shown in Fig. 3, be provided along the periphery with an elastic fixing device 19, e.g. in the form of a rubber band. This fixing device 19 may interact with a holding device 20 in the frame side portions, which makes it possible to, rapidly and easily, fix the filter edges in a releasable manner.

An expandable hygiene sealing 21, e.g. out of thin plastic, may also be present along the outer periphery of the filter medium and come into use when the soiled filter medium is to be replaced.

In order to more easily be able to mount and/or detach a filter medium unit as described above, the device described in the following may be optionally used.

In order to replace the above-described elastic fixing device 19, intended to hold filter media in a firm and sealed way, more or less stiff mounting ribs may be utilised in order to ensure such holding. This method is shown in Figs. 7-10.

Such an optional fixing of filter media in the frame may be achieved by e.g. mounting stiff edge ribs/side members 22 along the outer edge of the filter media part 16 which, when sewing up several filter blanks, will be positioned along the respective outer edge. For reasons of manufacturing technique, this stiffening rib 22 is attached to the filter medium 12 in parallel to the joining seams 18 of the filter blanks.

When the filter medium 12 and its ribs 22, firmly mounted at two outer sides, have been placed in the filter frame, the construction is fixed and complemented by inserting removable fixing ribs 23 along the remaining two side edges. These ribs 23 may be more or less resilient and/or elastic, either along their entire linear length or merely at one or both ends.

When detaching filter media, it is very easy to release the two resilient ribs 23 in the last described embodiment. These released ribs 23 may, together with the frame 13, be reused directly when soiled filter media are replaced by a new unit, for which reason the work proceeds very rapidly and simply.

The described construction is easy to use, since neither any particular force nor any tools have to be utilized.

The frame does not have to be manufactured from material which is as strong as hitherto has been necessary, since the major part of the pressure/tensile load is received by the wire grating 14 and the ribs 22 and 23, respectively, stiffen/reinforce the frame 13.

CLAIMS:

1. Blank for air purification filter,
c h a r a c t e r i z e d i n that recesses (15), provided at both short sides of the filter blank, are intended to form a seam line (17) when sewn to an adjacent filter blank, which seam line (17) is intended to, as a supporting line (17), be lower than the corner side portions (18) of the filter blank.

2. Filter unit comprising at least one filter blank according to claim 1,
c h a r a c t e r i z e d i n that the number of filter blanks which have been joined to form one unit are placed into a frame (13) with a wire grating (14), whereby the grating (14) supports the major part of the pressure/tensile load.

3. Filter unit according to claim 2,
c h a r a c t e r i z e d i n that an elastic fixing device (19), interacting with a device (20) in the filter frame, is situated along the outer side edges of the combined unit.

4. Filter unit according to claim 2,
c h a r a c t e r i z e d i n that an expandable hygiene sealing (21) is inserted in the filter frame (13).

5. Filter unit according to claim 2,
c h a r a c t e r i z e d i n that a stiffening edge rib (22) is mounted along the two respective outer edges of the unit.

6. Filter unit according to claim 2, c h a r a c t e r i z e d i n that two ribs (23), elastic and/or provided with a resilient catch, are arranged for the stiffening of the two remaining side portions of the unit in relation to the frame.

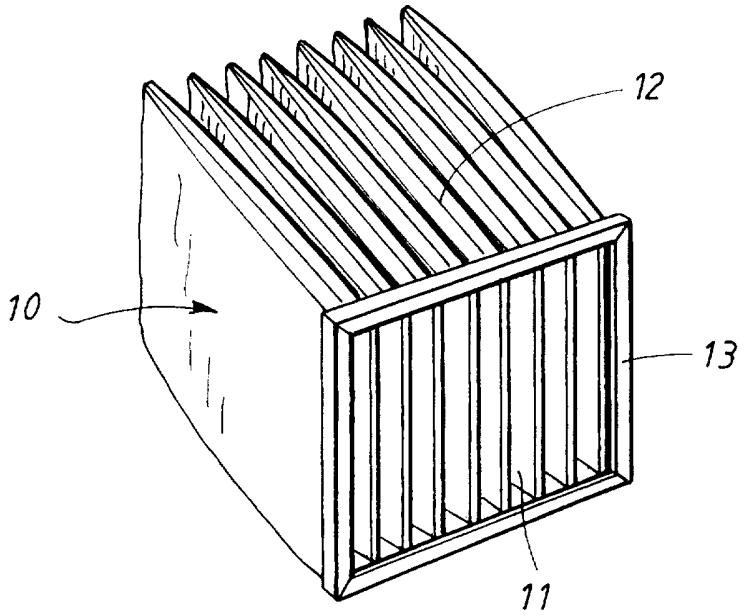

FIG. 1

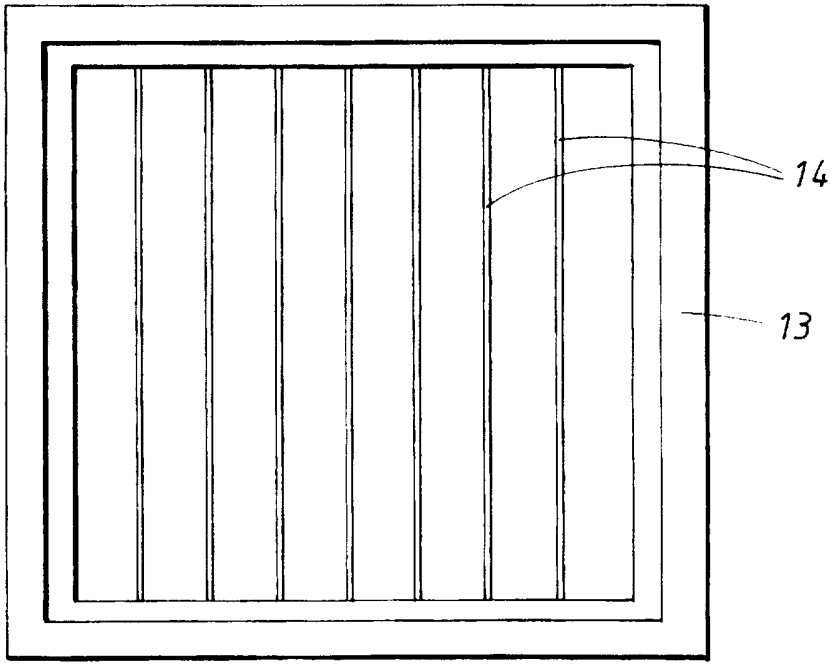

FIG. 2

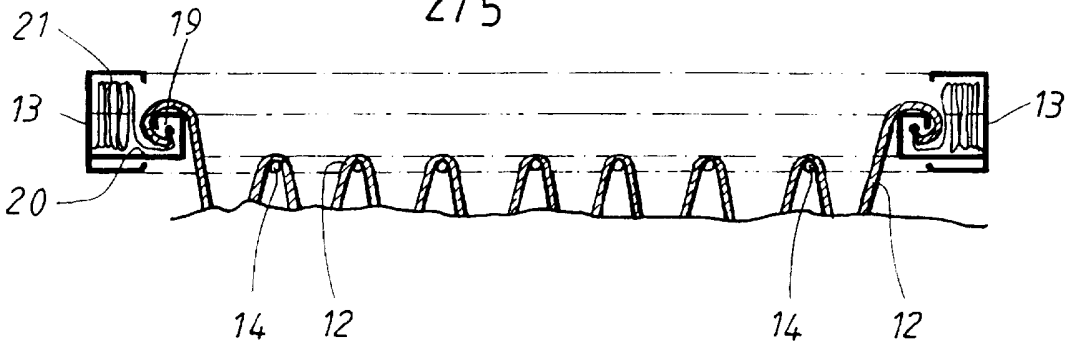

FIG. 3

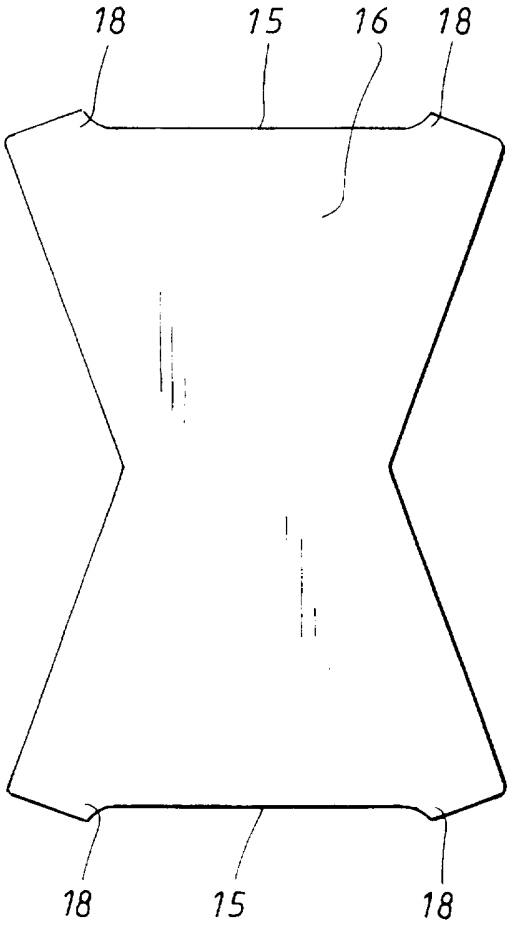

FIG. 4

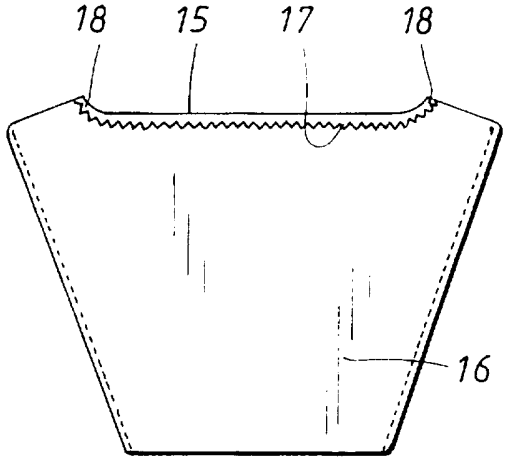

FIG. 5

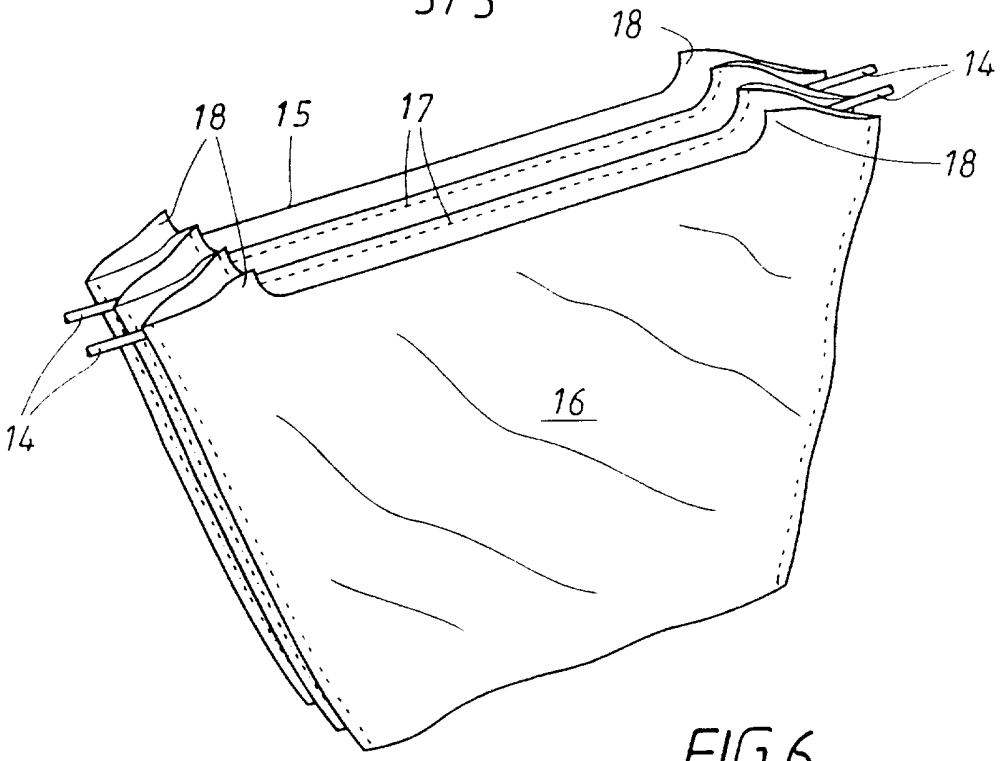

FIG.6

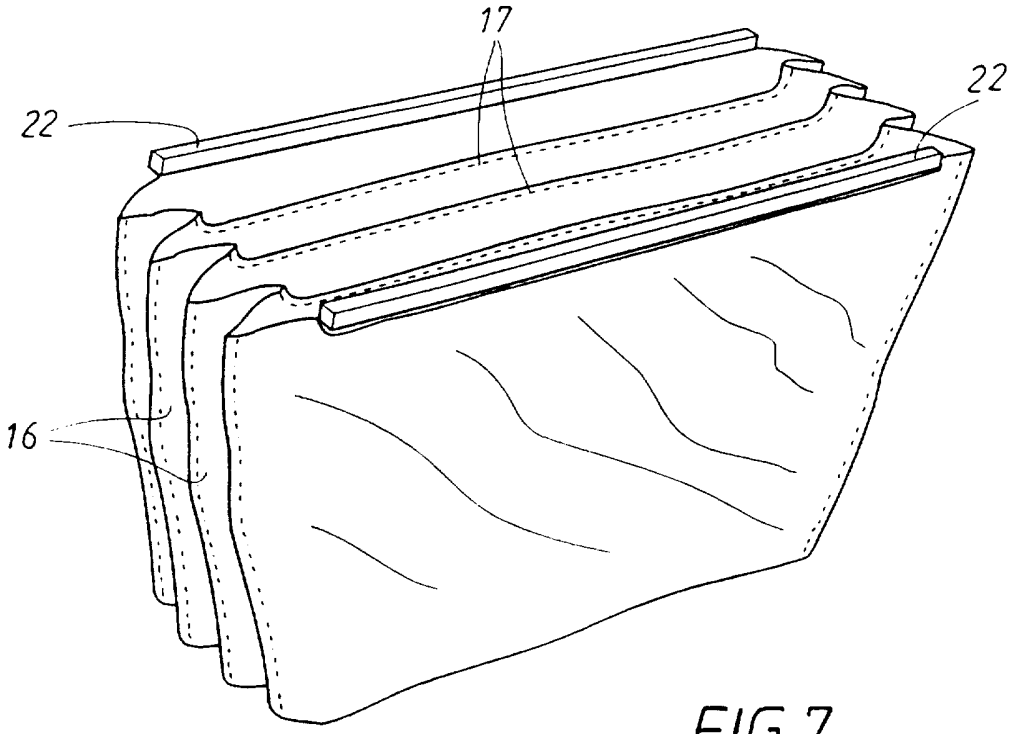

FIG.7

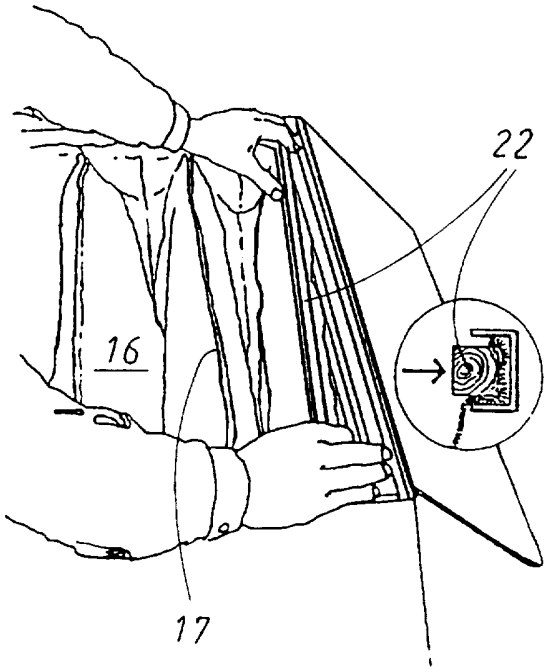

FIG. 8

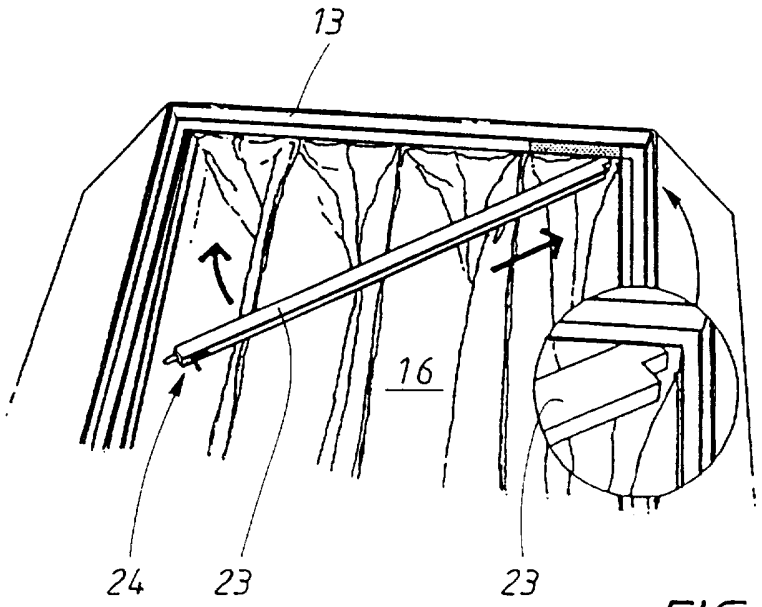

FIG. 9

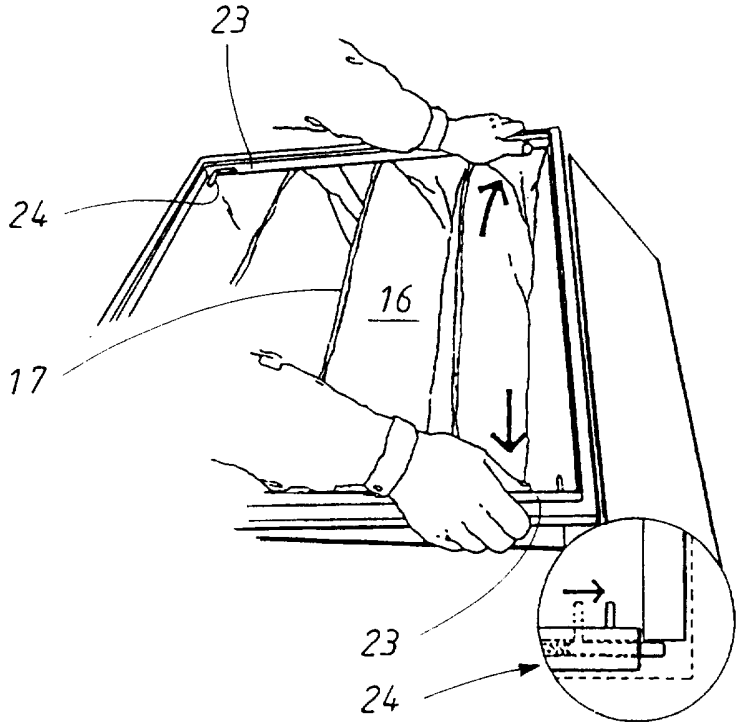

FIG.10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/SE 97/00644

A. CLASSIFICATION OF SUBJECT MATTER

IPC6: B01D 46/52, B01D 27/06, B01D 27/35
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC6: B01D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

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Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 1291613 A (AMERICAN AIR FILTER COMPANY, INC.), 4 October 1972 (04.10.72) --	1
A	US 4056375 A (WOLFGANG RINGEL ET AL), 1 November 1977 (01.11.77) --	1
A	US 4325718 A (ROBERT B. BURKHEAD), 20 April 1982 (20.04.82) --	1
A	EP 0465843 A1 (UNIFIL AG), 15 January 1992 (15.01.92) --	1

☐ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

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