

FILTER

This invention relates to filters for air or gases, of the general kind described in Australian Patents Nos. 421058 and 510814. Such filters are normally employed in air-conditioning ducts and the like.

An object of the invention is to provide a filter of this general type, in which the wire content and labour involved in wire working for the frame are both reduced. Another object of the invention is the provision of a filter of this general kind offering greater simplicity in cutting of filter media and media sewing compared with prior art filters. A further object of the invention is the provision of a filter which stacks more readily with other filters than those of the prior art, thereby reducing storage and transport costs.

According to the present invention, a filter frame for the support of a flexible filter medium in the configuration of an approximately frusto-pyramidal part with a re-entrant conical part comprises a front frame portion defining the base of said approximately frusto-pyramidal part, a rear frame portion defining a circle, frame side members extending between said front portion and said rear portion to support said

approximately frusto-pyramidal part, and an inner frame portion extending forwardly from said rear portion to an inner end of said inner frame portion to support said conical part.

5 The invention will now be described, by way of example only, with reference to the accompanying drawings which show a presently contemplated embodiment. In the drawings:

10 Figure 1 is a side elevation of a wire frame suitable for the application of the present invention;

 Figure 2 is a plan view of the wire frame of Figure 1;

15 Figure 3 is an isometric view of the frame of Figure 1 assembled with a filter medium and a peripheral frame;

 Figure 4 shows the development of the outer part of the filter medium; and

 Figure 5 shows the development of the conical re-entrant portion of the filter medium.

20 The illustrated filter comprises a wire frame consisting of front members 10 which make up a front frame portion, side members 11, a circular rear frame portion 12 and re-entrant frame side members 13.

25 It will be observed that the side members 11 are tapered inwardly as they proceed rearwardly from the front members 10, to form what is substantially a

truncated square pyramid, but having a circular section in the plane of truncation, while the re-entrant members 13 and the circular member 12 define a cone.

This combination of shapes is, of course, repeated in the form of the filter medium 14, which is manufactured from two pieces, developments of which are shown respectively in Figures 4 and 5. The portion illustrated in Figure 4, which forms the frusto-pyramidal part 15, is formed in the shape of four generally trapezoidal segments, which provide an arcuate inner edge 16, while the conical re-entrant part 17 is formed from the developed cone shown in Figure 5. While the portion of the medium shown in Figure 4 is illustrated as comprising four segments, this is for the purpose of clarity; normally this blank will be cut as a single piece of material.

The filter medium 14 is retained in place in relation to the frame by virtue of the edge region 18 of the pyramidal part 15 being engaged between the frame members 10 and a peripheral supporting frame 19, as in the arrangements described in the above-mentioned Australian Patent No. 510814, and by fixing the apex of the conical part 17 to the apex formed by the members 13, by means of tapes (not shown) sewn to the part 17.

Releasable clamps 21 are provided on two of

the members 10, for engagement with the supporting
frame 19.



Claims:

1. A filter frame for the support of a flexible filter medium in the configuration of an approximately frusto-pyramidal part with a re-entrant conical part, said frame comprising a front frame portion defining the base of said approximately ~~approximate~~ frusto-pyramidal part, a rear frame portion defining a circle, frame side members extending between said front portion and said rear portion to support said approximately frusto-pyramidal part, and an inner frame portion extending forwardly from said rear portion to an inner end of said inner frame portion to support said conical part.
2. A frame according to claim 1, wherein said front frame portion defines a square, said frame side members extending between the corners of said square and said rear frame portion.
3. A frame according to claim 2, wherein said inner frame portion comprises re-entrant frame members extending from said rear frame portion to an apex.
4. A frame assembly for an air or gas filter comprising a frame according to any preceding claim and a peripheral frame member which surrounds the said



front frame portion for mounting said frame within a duct.

5. A filter medium for an air or gas filter,
5 comprising a first part of approximately frusto-
pyramidal shape tapering inwardly from an open forward
end to a rearward end, and a second part of
approximately conical shape extending from the rearward
end of said first part such that said second part may
10 be placed in re-entrant fashion within said first part.

6. A filter medium according to claim 5, wherein
means for the attachment of said medium to a filter
frame are provided in the region of the apex of said
15 second part.

7. A filter medium according to claim 5 or 6,
wherein said first part is formed from a blank having a
shape substantially as described and illustrated with
20 reference to Figure 4 of the accompanying drawings.

8. An air or gas filter comprising a frame
assembly according to claim 4 and a filter medium
according to any one of claims 5 to 7, the open end of
25 said medium being located between said peripheral frame
member and said front frame portion, and the apex of



said second part of said medium being attached to the inner end of ~~the~~ said ~~end~~ inner frame portion.

9. A filter frame substantially as described
5 herein with reference to Figures 1 and 2 of the accompanying drawings.
10. A filter medium formed by the interconnection
10 of parts substantially as described herein with reference Figures 4 and 5 of the accompanying drawings.
11. A filter assembly substantially as described herein with reference to Figure 3 of the accompanying drawings.
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