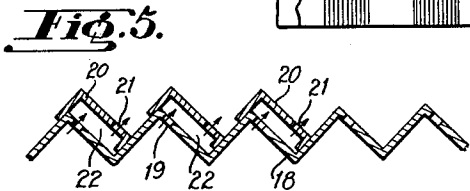
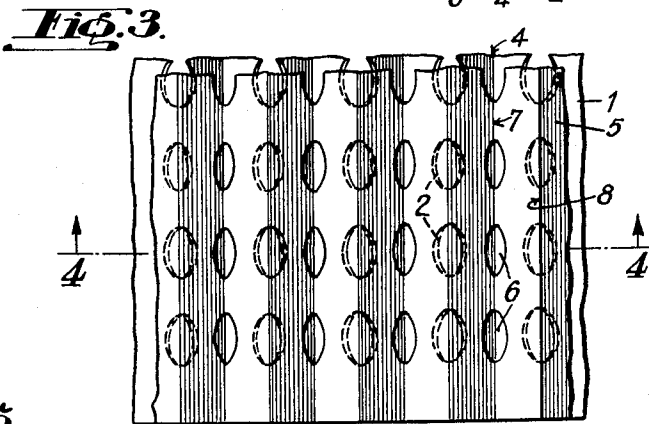
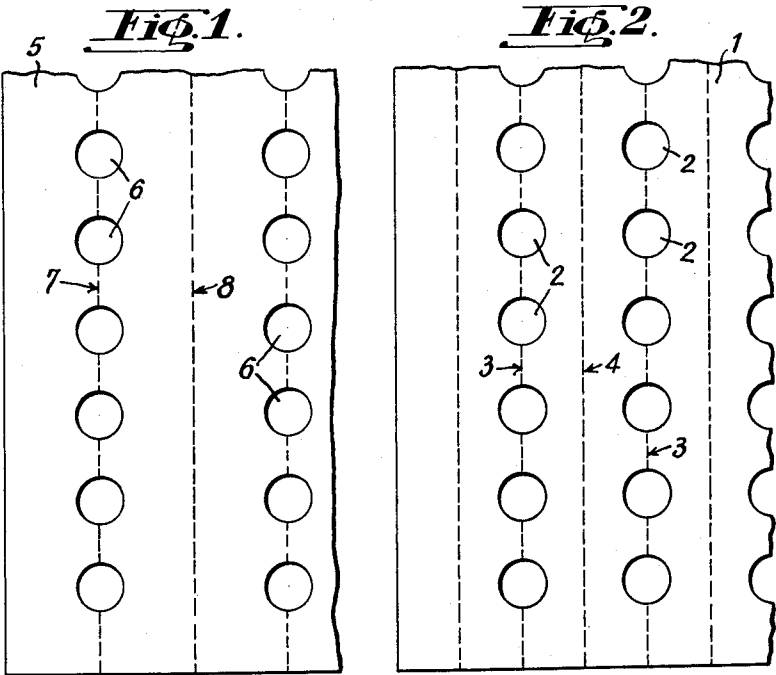


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E. C. ANDREAE
GAS FILTER

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3,075,337 GAS FILTER

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It is often necessary to purify the air in rooms when this air is loaded with suspended particles which are dangerous or embarrassing for work carried out in these rooms or for the persons who live therein. It is also desirable to filter smoke in order to avoid the contamination of the surroundings. Numerous air or smoke filters are known which all have the disadvantage of clogging rapidly. There also exist numerous air purification plants, but they are cumbersome and costly. The aim of the present invention is to provide a gas filter, economical and permitting the passage of a considerable amount of gas before the necessity of changing the same.

The gas filter which is the object of the invention comprises at least two perforated walls, joined one to the other along parallel lines in order to form chambers between them and so that the gas penetrating into the said chambers through the perforations of one of the walls strikes against non-perforated areas before leaving these spaces through the perforations of the other wall, and it further comprises pleated parts, which may be deformed between a position of use and a position of transport or stocking in which the two walls are in contact and the above-mentioned chambers have a negligible volume.

The accompanying drawing shows, by way of example, four embodiments of the filter according to the invention.

FIGURES 1 and 2 are expanded views of two walls comprising the first embodiment.

FIGURE 3 is a view in elevation of this first embodiment.

FIGURE 4 is a section along 4-4 of FIG. 3.

FIGURE 5 is a sectional view of a second embodiment.

The first embodiment shown in FIGS. 1 to 4 comprises a first flexible wall 1 of paper, cardboard or pliant plastic material and which may be impregnated or covered with an absorbing substance having perforations 2 arranged in vertical parallel rows. The sheet 1 is folded in zigzag and has folds 3 passing along the rows of perforations and folds 4 passing between two rows of perforations. A second wall 5, of the same composition as the first, also has perforations 6 arranged in vertical parallel rows. The sheet 5 is folded in zigzag and has folds 7 passing along the rows of perforations 6 and folds 8 passing between two rows of perforations. The unfolded sheet 5 is larger than the sheet 1, that is to say that the length of the sheet 5 between two consecutive folds is greater than the length of the sheet 1 between two consecutive folds. On the unfolded walls (FIGS. 1 and 2), the rows of perforations 6 of the wall 5 are thus at a greater distance from each other than the rows of perforations 2 of the wall 1. As a result, when the walls are joined one to the other by placing in contact, for example by gluing, the outer parts of the folds 7 of the wall 5 with the inner parts of the folds 4 of the wall 1, chambers 9 are formed between the two walls.

If one passes through this filter air loaded with particles in suspension, for example paint particles in a spray-gun painting plant, so that the contaminated air is projected perpendicularly to the wall 1 and penetrates through the perforations 2 into the chambers 9 as shown by the arrows 10 (FIG. 4), the contaminated air strikes against the non-perforated areas of the wall 5 facing the perforations 2 and the particles in suspension in the air are deposited on the said areas. The air is driven along the folds of the wall 5 and issues out through the perforations 6 of the latter as shown by the arrows 11. Experience shows that when flowing out, the air is practically completely cleared of the particles in suspension which it contained before passing through the filter.

For transport or stocking, the filter may be entirely folded in concertina fashion by constricting the folds of the two walls, the latter constituting pleated deformable parts which enter into contact one with the other rendering negligible the volume of the chambers 9. It should be noted that the filter could also be used by placing the rows of perforations horizontally, and not vertically as in the example described.

The embodiment shown in FIG. 5 comprises a wall 18 folded in zigzag and having perforations 19. Walls 20 having perforations 21 are fixed to each fold of the wall 18 so as to form therewith chambers 22. The operation of this embodiment is similar to that of the other embodiment described. Moreover, the latter embodiment may be folded for transport so as to put the wall 18 and the walls 20 into mutual contact in order to render negligible the volume of the chambers 22.

What I claim is:

1. A filter structure comprising at least two sheets of material disposed opposite each other, apertures disposed in spaced parallel rows in one of said sheets, further apertures disposed in spaced parallel rows in a second sheet, the distance between each row of further apertures in said second sheet being greater than the distance between each row of apertures in said one sheet, each sheet having parallel folds in zig-zag manner, certain of the folds passing through the rows of said apertures and certain other folds passing equidistantly therebetween, and means connecting the folds passing through the rows of apertures of one sheet with the folds equidistantly between the folds passing through the rows of apertures of the second sheet to form and delimit a plurality of chambers therebetween.

2. A filter structure comprising at least one sheet of material folded in a zig-zag manner to form a plurality of surfaces delimited by spaced parallel folds, a row of apertures disposed in every other surface of said zig-zag sheet, walls disposed in spaced relationship over each surface containing said row of apertures, each wall having members connected to the unapertured surfaces on each side of each surface containing said row of apertures, a further row of apertures disposed in each wall in offset relationship with respect to the row of apertures in the surface over which each wall is disposed, and chambers formed and delimited by said walls, members of said walls connected to the unapertured surfaces, and said apertured surfaces.

3. A filter structure comprising at least two walls having parallel foldings in zig-zag fashion and being disposed opposite each other, the distance between the foldings of a first wall being shorter than the distance between the folds of a second wall and the two walls being connected to each other along every second folding of each wall in order to form and delimit a plurality of chambers, rows of perforations disposed in parallel relationship in each wall, said rows of perforations, of said first wall being disposed along the foldings unconnected to said second wall and said rows of perforations of said second wall being disposed along the foldings connected to said first wall, said filter structure being deformable between a position of use in which said chambers have a substantial volume and a position of storage in which said walls are substantially in contact and said chambers have a substantially negligible volume.

4. A gas filter structure comprising at least one wall

having parallel foldings and being folded zig-zag-wise, a plurality of second walls consisting of wall parts connected to said one wall in a substantially parallel arrangement and spaced from every other strip of the zig-zag folded wall to form and delimit a plurality of chambers, rows of perforations disposed in the strip of the zig-zag folded wall over which said second walls are disposed, and further rows of perforations disposed in said second walls, said rows of perforations being disposed in such a manner that the rows of perforations of one wall lie laterally shifted with respect to the perforations of the opposite wall, the filter structure being deformable between a position of use in which said chambers have a substantial volume and a position of storage in which said walls are substantially in contact and said chambers have a substantially negligible volume.

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