

Aug. 13, 1946.

O. H. SCHAAF

2,405,716

FILTER PANEL

Filed March 30, 1944

2 Sheets-Sheet 1

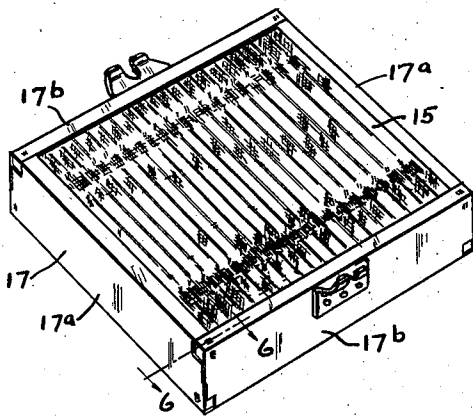


FIG 1

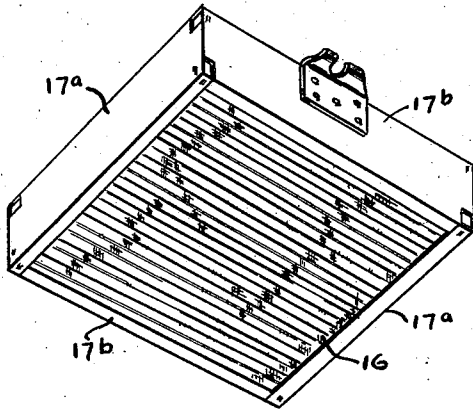


FIG 2

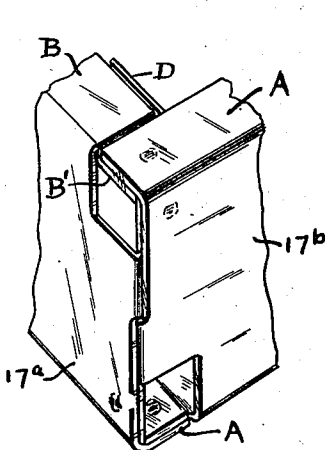


FIG 3

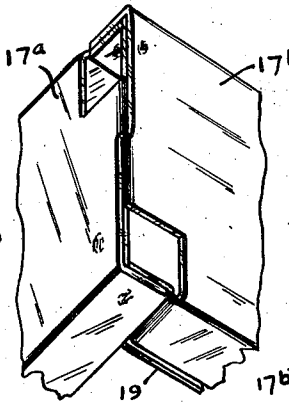


FIG 4

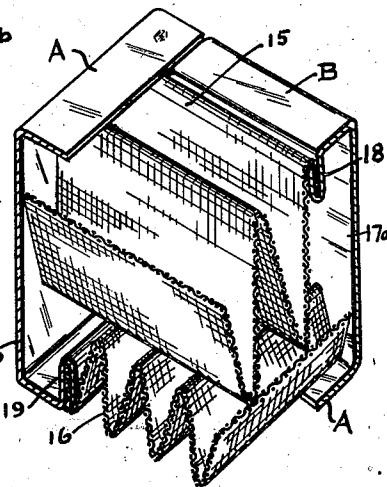


FIG 5

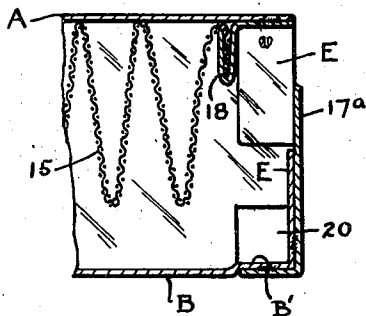


FIG 6

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2 Sheets-Sheet 2

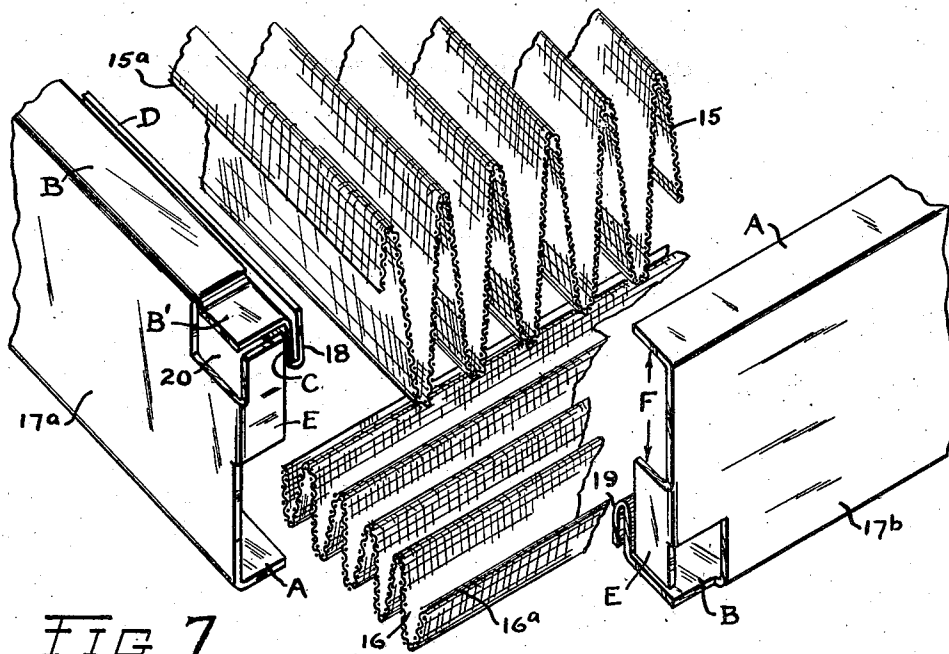


FIG 7

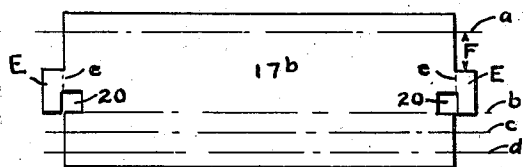


FIG 10

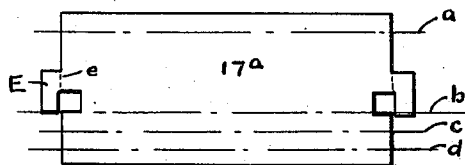


FIG 11

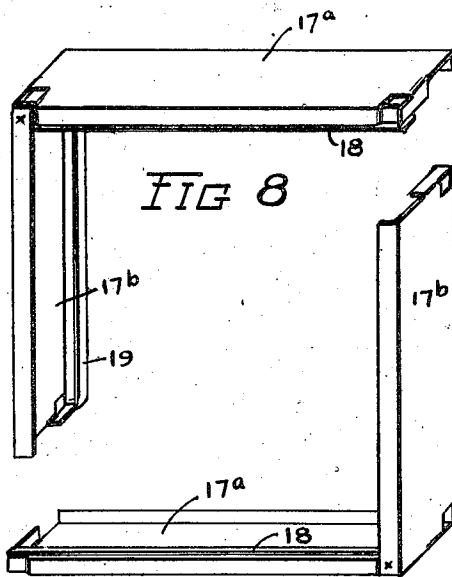


FIG 8

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UNITED STATES PATENT OFFICE

2,405,716

FILTER PANEL

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Application March 30, 1944, Serial No. 528,704

4 Claims. (Cl. 183—69)

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This invention relates to improvements in a filter of the panel type and more particularly to a panel of the type wherein stiff screen material is assembled within a surrounding frame.

An object of the present invention is to provide novel means for securing sheet filter material in a framework while at the same time providing a positive seal preventing the by-passing of a fluid stream between the filtering material and the surrounding frame.

Another object of the present invention is to provide a frame which is cheap to construct and in which it is easy to assemble a filtering medium and to secure the same in place without special tools.

Another object of the invention is to provide a novel frame for a filter panel wherein the same die may be utilized for forming the sheet material at all corners of the frame while at the same time provide an interlocking structure at the frame corners easily secured together as by welding.

Other objects and advantages in the invention will be apparent from the accompanying drawings and description, and the essential features will be summarized in the appended claims.

In the drawings,

Fig. 1 is a top perspective view of the panel embodying my invention;

Fig. 2 is a bottom perspective view of the same;

Fig. 3 is an enlarged fragmental view of the lowermost corner of the device of Fig. 1;

Fig. 4 is an enlarged fragmental view of the uppermost corner of the device of Fig. 2;

Fig. 5 is an enlarged fragmental view of a portion of the uppermost corner of Fig. 1 broken away to more clearly show the construction;

Fig. 6 is an enlarged fragmental sectional view taken along the line 6—6 of Fig. 1;

Fig. 7 is an exploded view showing the parts at the lowermost corner of Fig. 1 disassembled but in relative position for assembly;

Figs. 8 and 9 show the frame in partially assembled form; while

Figs. 10 and 11 show the blanks from which the sides of the frame are formed.

I have shown my invention as applied to a panel wherein two sheets 15 and 16 of stiff screen material are folded in zig-zag form and assembled in a frame 17 with the folds of the layer 15 extending at right angles to the folds of the layer 16. While this is a preferred form of my device, I do not necessarily limit myself to a panel having only two layers of screen material. The screen material may be of metal, plastic, or the like, and the filaments of the mesh material may be bare,

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or suitably coated as for instance, the cloth-covered material disclosed in the copending application of Clarence J. Glanzer, S. N. 529,925, filed April 7, 1944. I have shown a preferred form of my device wherein the zigzag folds of the layer 15 are deeper than the folds of the layer 16, but, here again, I do not desire to unnecessarily limit my invention to this form only. The above-mentioned layers of filter material 15 and 16 are shown assembled in a frame of generally rectangular shape, and I provide novel means for preventing the leakage of air or other fluid being filtered around the edges of the filter material. To this end the side members 17a parallel to the folds of layer 15 are each provided with a lip 18 formed by bending the sheet material of the frame at right angles away from the face of the filter panel and then bending the same back upon itself as clearly shown in Figs. 5, 6, and 7. The edge 15a of the layer 15 is placed between the parallel portions of the lip 18, and, to secure the parts firmly together at this point, the parallel portions of the lip may be squeezed tightly against the edge 15a of the filter material so as to hold the same permanently in place. Similar structure is provided on the two sides of the frame 17b (at right angles to the sides 17a) to secure the edges of the layer 16. To this end a lip 19 is formed on each of the sides 17b at the face of the panel opposite to that where the lips 18 are found. Here again the edges 16a of the layer 16 are placed between the parallel portions of the lips 19 and the parallel portions then squeezed down upon the filter material if desired to hold the same securely in place.

The frame 17 may be very cheaply but efficiently formed by cutting sheet material, such as metal, into the form of blank shown in Figs. 10 and 11. Fig. 10 shows the longer sides 17b while Fig. 11 shows the shorter sides 17a. It will be noted that the same die may be used for cutting the ends of the blanks of Figs. 10 and 11 thus saving the expense of dies. After the blanks are formed, each sheet is folded along the line a at right angles to form the lip A which overlies the screen material at one face of the panel. The sheets are folded along the lines b at right angles to form the portions B adjacent the lips 18 or 19 as the case may be. The sheets are again folded along the lines c at right angles to form that parallel portion C of lip 18 or 19 which is nearest the frame. The blanks of Figs. 10 and 11 are finally folded back along the lines d to provide the portions D of the lips 18 and 19, which are parallel to the portions C. The ears

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E at each end of each panel are folded at right angles along the lines *e* so as to provide means for securing the corners of the frames together. It will be noted that the length of the ear E in the direction of panel depth is substantially equal to the dimension F. It results from this construction that when a corner is assembled, say with the parts in the position of Fig. 7, the ear E of the side 17b fits below the ear E of the side 17a and against the inner surface of the web of the side 17a. In like manner, the ear E of the side 17a will lie above the ear E of the side 17b and there engage the inner surface of the web of the side 17b. The ears E are then preferably spot-welded to the adjacent and contiguous walls of the frame sides. The openings 20 permit the introduction of welding electrodes for this operation. Preferably the ends of the frame portions B near the corners of the frame and alongside the openings 20 are recessed as indicated at B' by an amount substantially equal to the thickness of the portion A of the adjacent frame wall. This provides a construction flush at the surface of the face of the panel when the corner is assembled.

What I claim is:

1. A filter panel comprising a frame having four sides, open at its front and rear faces and adapted to fit in a duct, a sheet of filter material near one face of said panel folded in zig-zag folds parallel to two opposite sides of said frame, there being a recess portion in each of said sides opening toward said panel face, the last of said folds adjacent each of said sides entering one of said recess portions, a second sheet of filter material near the other face of said panel folded in zig-zag folds parallel to the other two sides of said frame, there being recess portions in each of said last named sides opening toward said other face of said panel, the edge folds of said second sheet entering said last named recess portions, and the edges of each sheet normal to

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said folds substantially abutting the sides of said frame.

2. A filter panel comprising a rectangular frame, the sides thereof formed of sheet material and the front and rear faces of said panel open for fluid flow therethrough, each side being formed of a sheet having at each corner end an opening through the sheet adjacent said end and adjacent one face of said panel, an ear integral with said sheet and extending at right angles to said side from a zone on the side of said opening remote from said panel face and extending thence to a terminus substantially in the plane of the said panel face, said sides assembled with each ear contiguous with the adjacent side, and means there securing said contiguous ears and sides.

3. The combination of claim 2 wherein each ear has a dimension from front to rear equal to approximately one-half the distance between said front and rear faces of said panel, whereby said ears at each corner interlock and reinforce the frame from front to rear of said panel.

4. A filter panel comprising a rectangular frame, the sides thereof formed of sheet material and the front and rear faces of said panel open for fluid flow therethrough, each side being formed of a sheet having its opposite ends of the same shape right and left hand, there being an ear projecting beyond the corner line at each end of each side, each ear having a dimension from front to rear equal to approximately one-half the distance between said front and rear faces and leaving the other half of said distance vacant, said ears being bent at right angles to their respective sides, said sides being assembled with each ear abutting an adjacent side and the ear of one side occupying the vacant space next to an ear of the adjacent side, and means securing each ear to the adjacent side of the frame.

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