METHOD AND MEANS FOR SUPPORTING FILTER PADS

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by Attorney.
Our Invention relates to methods and means for supporting filter pads and similar devices, especially pads which consist of loosely woven bags filled with fibrous material like excelsior. Such filter pads are relatively heavy when wet, and they tend to sag when positioned vertically, as frequently is necessary. It has thus far been found to be very difficult to overcome such sagging tendency, because of the impracticability of substantially compressing the filtering material, to aid in its support.

Our objects in this invention were, first, to provide a support adapted for maintaining a wet excelsior filled pad, or the like, in a vertical position, without substantially compressing the filling, and without material sagging of the filling at any point; second, to furnish a support of this kind which is adapted for being assembled very expeditiously, with the filtering pad in place therein; third, to supply an improved composite filtering unit which employs loose fibrous material as the filtering agent; and, fourth, to accomplish all these things by means of simple and relatively inexpensive construction.

Our objects have been attained in the manner illustrated in the accompanying drawing, which illustrates a preferred embodiment of our invention. In these illustrations—

**Figure 1** is a front elevation of our complete composite unit;

**Figure 2** is a rear elevation thereof;

**Figure 3** is a sectional elevation of the unit taken on a plane indicated by broken line 3—3 of Fig. 2; and

**Figure 4** is a much enlarged sectional elevation of the upper portion of the unit taken on a plane positioned approximately according to broken line 4—4 of Fig. 2.

Similar reference numerals refer to similar parts throughout the several views.

The form of our invention illustrated, includes a flat rectangular metallic frame 5, which has a suitable metallic screen 6 attached thereto and filling the opening thereof. The material of the frame should be at least slightly resilient, for a reason to be explained. The screen may conveniently be formed from light expanded metal, or from metal lath.

At the rear of the unit is a grid formed of stiff wire, preferably by welding. Its periphery 7 is slightly smaller than that of frame 5, and is similar thereto in shape and proportions. An even number of intermediate vertical bars 8 are attached to, and extend between, the top and bottom peripheral portions of the grid. These, together with the two side peripheral portions, constitute plural pairs of vertical supports for a relatively large number of U-shaped bars 9, the prongs 11 of which project horizontally inwardly.

A sufficient number of suitably positioned L-shaped members 12 are rigidly attached to intermediate portions of the inner side of frame 5, as by stove bolts 13; in such a way that one arm 14 of each of these members projects inwardly in a direction that normally is perpendicular to the plane of the frame. The free ends of these arms are formed with hook portions 15, adapted to engage and hold the periphery of wire grid 7; but only after the arms have been pressed outwardly in such a way as to slightly twist the intermediate portions of frame 5, as shown in Figs. 3 and 4 at 16. Thus the torsional resiliency of the frame serves to keep the hook arms pressed toward position perpendicular to the plane of the frame, and hence they are adapted to properly position grid 7.

The upper arm 14 may also serve for supporting a perforated water tube 17, for keeping the filtering material wet. A convenient arrangement for this purpose is shown to best advantage in Fig. 4. Such arrangement requires only making a circular hole in the arm for the tube, closely adjacent its upper edge, and providing a slot or kerf 18 leading to the hole from said edge. The thus-formed points 19 (Fig. 4) may be bent laterally in opposite directions, to allow the tube to enter its hole, and then be bent back again to retain the tube in place.

In the illustrated device, the filter proper consists of a suitably shaped and dimensioned bag 21, of loosely woven material like burlap, filled with fibrous material 22 such as excelsior. The bag is held in slight localized compression between screen 6 and wire grid members 7 and 8; and prongs 11, which easily penetrate the bag and the excelsior contents, serve to support the latter and prevent undue sagging thereof, even when the material is wet. The efficacy of the prongs in this respect is due to their multiplicity, and to the fibrous felted nature of the excelsior which is hung thereupon.

Because of the felted nature of the excelsior, a portion of the weight of lower portions will be borne by upper portions, and this effect is progressive upwardly. For this reason, we prefer to make use of progressively closer vertical spacing of U-bars 9 toward the top of the grid, as is indicated in Figs. 2 and 3.

Obviously our invention may take many specific forms, and be made of various kinds of material. Therefore we do not limit ourselves as to the
scope of the invention, except as it is defined by the appended claims.

We claim as our invention:

1. The method of supporting a filter mass of felted fibrous material which consists of confining it within a loosely woven bag and hanging it upon a multiplicity of spaced prongs extending into said mass and substantially therethrough.

2. The method of supporting a filter mass of felted fibrous material which consists of confining it within a loosely woven bag and hanging it upon a multiplicity of spaced prongs extending into said mass and substantially through said mass; the spacing between adjacent prongs being progressively less toward the uppermost thereof.

3. The method of supporting a filter mass of felted fibrous material which consists of confining it within a loosely woven bag and hanging it upon a multiplicity of spaced prongs extending into and substantially through said mass; the prongs being arranged in horizontal and vertical rows; and the spacing of the rows being substantially uniform horizontally, and progressively less vertically toward the uppermost thereof.

4. A filtering unit comprising: a screen element; a wire-grid element spaced from the screen; a filtering mass of felted fibrous material confined between the screen and grid; and a multiplicity of spaced prongs attached to the wire-grid element and extending well into said mass for supporting the weight thereof.

5. A filtering unit comprising: a vertical screen element; a vertical wire-grid element, spaced from the screen; a filtering mass of felted fibrous material confined between the screen and grid; and U-shaped barbs attached to the wire-grid element, and having prongs spaced from each other and adjacent prongs; said prongs extending well into said mass for supporting the weight thereof.

6. A filtering unit comprising: a vertical screen element; a vertical wire-grid element, spaced from the screen and having plural pairs of parallel rods extending from the top to the bottom thereof; a filtering mass of felted fibrous material confined between the screen and grid; and a plurality of spaced U-shaped barbs straddling each of said pairs of rods, attached thereto, and having prongs extending well into said mass for supporting the weight thereof.

7. A filtering unit comprising: a vertical screen element; a vertical wire-grid element, spaced from the screen and having plural pairs of parallel rods extending from the top to the bottom thereof; a filtering mass of felted fibrous material confined within a loosely woven bag and compressed slightly between the screen and grid; and a plurality of spaced U-shaped barbs straddling each of said pairs of rods, attached thereto, and having prongs extending through the bag into, and substantially through, said mass for supporting the weight thereof; the vertical spacing of each of said series of prongs being progressively less toward the uppermost thereof.

8. A construction as set forth in claim 4 wherein the screen is retained by a surrounding frame having hooks attached to the inner surface thereof, and wherein said hooks engage the wire-grid and position it with respect to the screen.

9. A construction as set forth in claim 4 wherein the screen is retained by a surrounding frame of resilient material having hooks rigidly attached to the inner surface thereof and normally projecting perpendicularly therefrom, and wherein said hooks have been deflected outwardly by torsionally warping the frame, and engage the wire grid for positioning it with respect to the screen.

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