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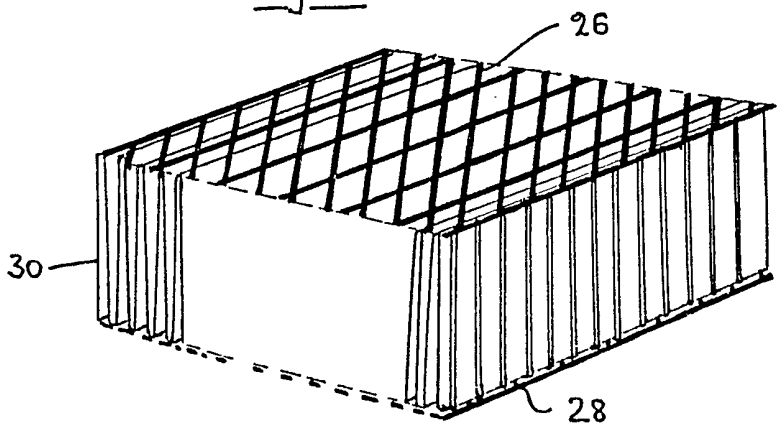
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(54) Reinforced pleated filtering material

(57) The invention is concerned with a fluid filtering medium formed by bonding a plastics coated metal grille (26) or other perforated reinforcing means to the peaks of the pleats on one or both sides of a block (30) of pleated filtering material.

Fig. 3.



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The drawings originally filed were informal and the print here reproduced is taken from a later filed formal copy.

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Fig.1.

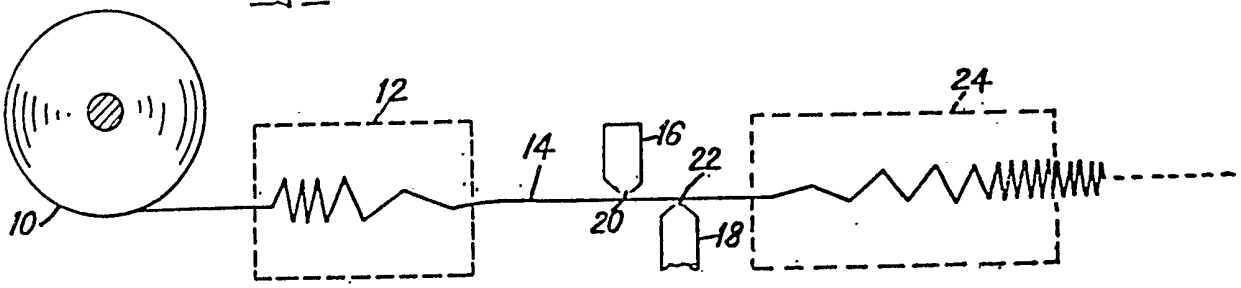


Fig.2.

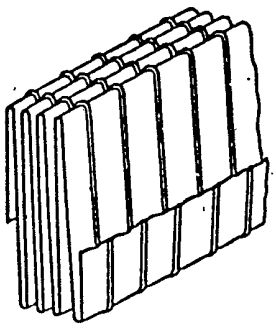
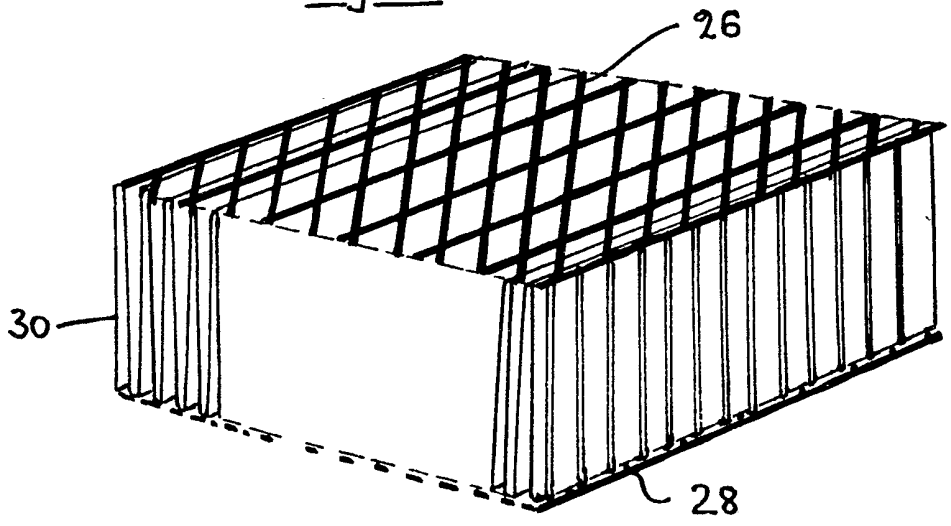


Fig.3.



SPECIFICATION

Reinforced pleated filtering material

This invention relates to pleated filtering material.

In my prior U.K. Patent No. 2,077,312 B I have described and claimed a method of making pleated filtering material which comprises folding the filtering material in zig-zag fashion and then opening it out again to form a substantially flat surface, applying spaced-apart lines, ribbons or blobs of hardenable synthetic plastics material in a flowable form to one or both surfaces of the filtering material, heating the synthetic plastics material by infra-red heating equipment immediately after it has been applied to the filtering material so as to accelerate hardening of the synthetic plastics material, and, after commencement of the infra-red heating but before its completion, folding the filtering material in zig-zag fashion to reform the pleats which are then held in place by the hardened synthetic plastics material.

The present invention is concerned with a development of that invention in that, once the pleated filtering material has been formed, the peaks of the pleats on one or both sides of the material are reinforced by one or more bonded-on grilles, perforated sheets or other such perforated reinforcing means permitting the flow of fluid through the pleated filtering material.

A specific example of reinforced pleated filtering material in accordance with the invention as well as a method and apparatus for making it are shown in the accompanying drawing, in which:—

Figure 1 shows, diagrammatically, apparatus for making pleated filtering material;

Figure 2 is a perspective view of pleated filtering material produced by the said apparatus; and

Figure 3 is a perspective view of pleated filtering material after it has been reinforced by bonded-on grilles in accordance with the invention.

The apparatus shown in Figure 1 comprises a roll 10 of filtering material in sheet form. This can, for example, be filter paper, glass fibre paper, open-pore polyurethene foam material, random fibre mat, or some other filtering material which is available in sheet form.

The filtering material is drawn off the roll 10 by means not shown in the drawing into or past initial folding means 12 which fold the material in zig-zag fashion. The material is then opened out again to form a substantially flat surface as shown at 14, whereupon it passes under and above, respectively, two transverse lines of nozzles 16 and 18 which extend across the full width of the filtering material. The delivery openings 20 and 22 of the nozzles 16 and 18 are located between 1mm and 5mm from the surface of the filtering material. Assuming that the filtering material has a width of, say, 0.5 of a metre, the nozzle openings 20, 22 can be between 2cm and 5cm apart. Each nozzle 16, 18 is supplied with molten PVC or some other synthetic plastics material of low melting point from a pressure container (not shown) having heating means to melt the plastics material.

Immediately after the sheet filtering material has moved past the nozzle 18, it is subjected to infra-red heating from infra-red heating apparatus 24. This heating hardens the PVC very rapidly. While this hardening is taking place the filtering material is refolded in zig-zag fashion to reform the pleats originally formed in it at the initial folding station 12. By the time the pleats are reformed the PVC has already hardened to a tacky state. The ribbons or lines of PVC on adjacent pleats therefore adhere to each other, and in this way the pleats are held in place very firmly once the PVC has thoroughly hardened. The thus-produced pleated filtering material will then have the form illustrated in Figure 2 of the drawing.

Variations can be made in the apparatus described above. For example, provision can be made for each line or ribbon of molten PVC to have a core of string, cord, wire or nylon which gives added strength to the filtering material.

The pleated filtering material shown in Figure 2 is then, in accordance with the invention, reinforced by perforated reinforcing means as shown in Figure 3. Two grilles or perforated sheets 26 and 28 are bonded to the peaks of the pleats on both the top and bottom surfaces of the "block" of filtering material 30. The bonding is preferably achieved by using grilles or perforated sheets of metal which are heated after they have been coated with a synthetic plastics material in powder form. The heat causes the powder to melt and to form a film over the metal of the grilles. With the grilles and their coatings in this state, the grilles are applied to the peaks of the pleats on the top and bottom surfaces of the block 30. Once the coatings solidify, the grilles 26 and 28 will be found to be firmly bonded to the block 30 so as to give the latter enhanced mechanical strength without impairing the flow of fluid through the pleated filtering material.

CLAIMS

1. A fluid filtering medium comprising pleated filtering material, in which the peaks of the pleats on one or both sides of the pleated material are reinforced by one or more bonded on grilles, perforated sheets or other such perforated reinforcing means permitting the flow of fluid through the pleated filtering material.

2. A fluid filtering material according to claim 1, in which the grilles or other reinforcing means are made of metal and are heated during manufacture of the fluid filtering medium after they have been coated with a synthetic plastics material in powder form, the grilles being applied to the peaks of the pleats after the synthetic plastics powder has melted and formed a film which serves as a bonding agent.

3. A fluid filtering medium according to claim 1 or claim 2, in which the pleated filtering material comprises filtering paper, glass fibre paper, open-pore polyurethene foam material or random fibre mat.

4. A fluid filtering medium according to any one of claims 1 to 3, in which the pleats are held in the pleated filtering material by ribbons or lines of synthetic plastics material which has been applied to the filtering material in liquid form.

5. A fluid filtering medium according to any preceding claim, in which the pleats of the pleated filtering material lie generally parallel with one another.

6. A fluid filtering medium substantially as described herein with reference to Figure 3 of the accompanying drawings.

7. A fluid filtering medium according to any preceding claim incorporating pleated filtering material produced by a method substantially as described herein with reference to Figures 1 and 2 of the accompanying drawings.

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