

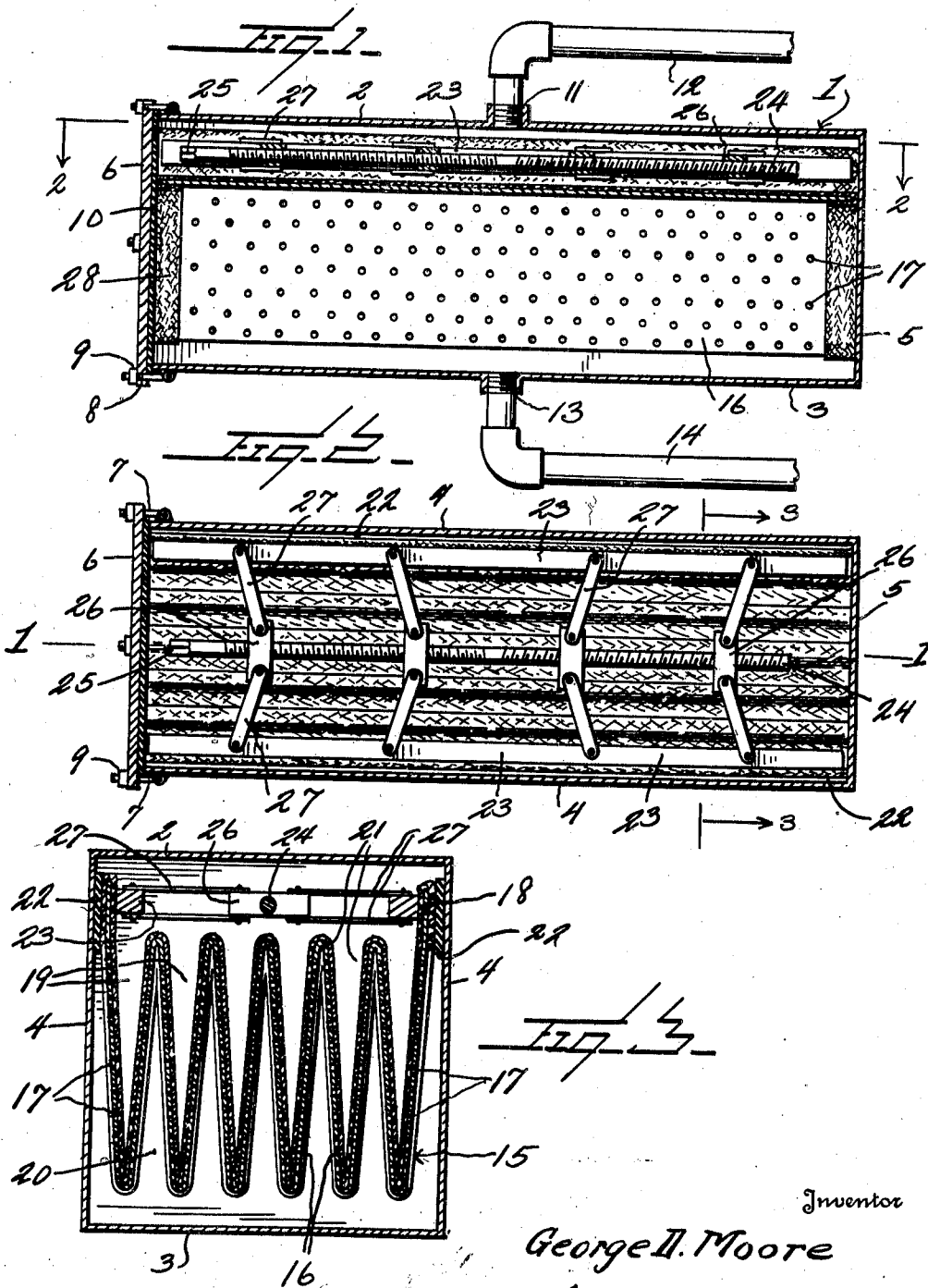
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FLUID FILTER

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FLUID FILTER

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This invention relates generally to improvements in filtering devices and pertains particularly to the devices used for filtering cleaning solutions, in association with which a filtering powder is employed.

In dry cleaning establishments use is made of cleaning solutions which are continuously run through cleansing filters so that the solution may be used over and over again and in such filters there is employed a powder which adheres to one side of a straining cloth and forms a suitable filter bed through which the fluid is run. In filters of known construction the powder is caused to collect against a vertical wall or walls and so long as the fluid continues to move there-through the powder maintains its caked condition on the wall but if the fluid flow is stopped the powder falls away from the wall and consequently when the circulation of the fluid is resumed some of the fluid will pass through either unfiltered or in an improperly filtered condition as the proper thickness or depth of powder deposit does not exist over the entire wall of fabric against which it is deposited.

The primary object of the present invention is to provide an improved filtering unit in which the construction is such that there is not only provided a fabric surface against which the filtering powder is deposited which is disposed in such manner as to cause the powder to maintain its condition thereon even though the fluid flow may be discontinued but which is constructed in such a manner that a large filtering surface is obtained within a relatively small enclosed area.

Another object of the invention is to provide a filtering device in which the filtering unit is disposed in a novel manner within a housing to not only provide a maximum filter surface or area in a small housing but in a manner to facilitate its easy removal and replacement when desired or necessary.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing, it being understood, however, that the invention is not to be considered as limited by the specific illustration or description but that such illustration and description constitute a preferred embodiment of the invention.

In the drawing:

Fig. 1 is a vertical longitudinal section through the filtering unit embodying the present invention, the section being taken substantially on the line 1-1 of Fig. 2.

Fig. 2 is a horizontal section taken on the line 2-2 of Fig. 1.

Fig. 3 is a transverse section taken on the line 3-3 of Fig. 2.

Referring now more particularly to the drawing the numeral 1 generally designates the housing for the present filter, the same being shown as of elongated rectangular design and assuming a horizontal position when in use. As shown, the housing comprises the top and bottom walls 2 and 3 respectively, side walls 4, a rear or back end wall 5, and a removable front wall 6. The front wall 6 forms a head which is detachably secured to the housing in any suitable manner, there being here shown the hinged bolts 7 which are attached to the walls 2, 3 and 4 and which engage in suitable slots 8 in the edges of the head 6 to receive the securing nuts 9 which bear against the head and force the same toward the adjacent edges of the supporting walls. A suitable gasket 10 is interposed between the head 6 and the edges of the adjacent walls to form a fluid tight joint or connection.

The top wall 2 is provided with an inlet nipple 11 to which is attached a fluid conducting pipe 12 which carries the cleaning fluid into the top of the filter unit while the bottom wall 3 is provided with a similar nipple 13 to which is connected a fluid return or carry off pipe 14.

Disposed horizontally within the housing between the side walls 4 is a removable filtering unit which is indicated generally by the numeral 15 and which is secured at its opposite sides to the side walls but is spaced from the top and bottom walls as is clearly shown in Fig. 3.

The removable filtering unit 15 is formed of sheet metal or other suitable material and has a length equal to the interior length of the housing. This sheet is bent longitudinally along a number of parallel lines to form a number of plaits or folds 16 which are provided with numerous apertures 17, the width of the folds or plaits being the same except for the outermost ones each of which is extended at the free edge thereof beyond the top of the unit to form the upwardly extending longitudinal top wings 18. The plaits thus formed to extend longitudinally of the sheet metal body of the filter unit provides, when the body is disposed with outer side or bordering plaits in opposed relation with the side walls, the substantially V-shaped spaces 19 which open upwardly and which alternate with correspondingly formed spaces 20 which open downwardly.

Disposed over the top surface of the perforated

sheet metal body which forms the frame work of the filtering unit, is a covering of suitable fabric 21 which lies in and takes the form of the V spaces 19 and which is extended upwardly and over the extended side portions 18 in the manner illustrated in Fig. 3. Thus the cleaning fluid and cleaning powder which is introduced into the filter by way of the pipe 12 will collect in the spaces 19 upon the inclined opposing walls of the fabric and form a filter cake through which the fluid will pass.

Between the outer sides of the extended portions 18 and the adjacent side walls are placed packing or gasket strips 22 which, when the hereinafter described clamp is placed in position establish a leak tight joint between the sides of the filter and the side walls of the housing.

The clamp by which the filter unit is maintained in position in the housing comprises the two spaced parallel jaw bars 23 between which lies in parallel relation therewith the screw or threaded shaft 24, one-half of which is provided with screw threads of one hand while the opposite half is provided with screw threads of the opposite hand. The end of this threaded shaft nearest the head 6 is squared or otherwise suitably formed as indicated at 25 to facilitate the attachment of a wrench or other suitable implement thereto for effecting the turning of the shaft.

Upon the shaft is threaded a series of nuts 26 and these nuts are pivotally coupled with the adjacent jaws 23 by the toggle links 27. Since the shaft when rotated will feed half of the nuts 26 in one direction and the other half in the opposite direction it will be readily seen that the toggle links will be extended or retracted to separate or draw together the jaw bars 23. This clamp unit is disposed longitudinally in the casing between the extended upper portions 18 of the filter unit and when the jaws are separated they function to force the sides of the filter unit against the gasket 23 to compress the latter against the adjacent side walls thus establishing the previously referred to leak tight joint between the top part of the filter unit and the casing walls.

The height of the filter unit is materially less than the interior height of the casing and when the filter unit is placed in the casing it is located with the bottom portion thereof spaced from the bottom wall 3 of the casing and with the top portion spaced a slightly greater distance from the top wall 2 so as to allow for the insertion of the clamp unit. Thus it will be seen that ample space is provided above and below the filter unit for the free circulation of the cleaning liquid into and out of the casing.

As is shown in Fig. 1, the fabric covering for the perforated body of the filtering unit is carried around the ends of the plaits, such turned ends of the fabric being indicated by the numeral 28, and turned portions of the fabric are pressed

against the adjacent front and rear walls of the casing to prevent the passage of the filter powder across the ends of the plaits of the unit.

From the foregoing it will be readily apparent that the filtering device of the present invention not only provides a unit in which the fabric walls are so disposed as to maintain the layers of filtering powder intact when the flow of cleaning fluid is interrupted but which is so designed as to give a maximum filtering area in a minimum of space.

It will, of course, be readily apparent that the filtering device can be built in different sizes and that the accordion-like or plaited filtering screen or unit can be readily adapted to casings of different sizes and that the number of plaits or folds in the units can be increased or decreased as desired to vary the effective area of filtering surface.

What is claimed is:

1. A fluid filter comprising an elongated casing having top, bottom and side walls and front and rear walls, said front wall being removable, a fluid inlet means opening through the top wall, a fluid outlet means opening through the bottom wall, and a filtering unit extending throughout the length of the casing and disposed within the same between said side walls and spaced from the top and bottom walls, said unit comprising a sheet of foraminous material folded to provide a plurality of plaits, and an expansible means lying between and securing the free longitudinal edges of the opposite plaits of the sheet of material against the inner sides of the side wall.

2. A filter of the character set forth in claim 1 in which the said opposite plaits have their free longitudinal edges extended above the intermediate plaits, and said securing means comprises a clamp disposed above the sheet and having coupled outwardly pressed jaws engaging and pressing the extended portions of the outermost plaits against the adjacent side walls.

3. A filter comprising a casing having opposite top and bottom inlet and outlet openings, a filtering unit disposed across the interior of the casing between the inlet and outlet openings and dividing the casing into upper and lower chambers with which said openings respectively communicate, said filter unit comprising a plurality of joined V-sections in parallel relation, the bordering sections having outer free edges disposed above the horizontal plane of the top edges of the other sections, a gasket element interposed between each of said free edges and an adjacent wall, and clamping means for securing said free edges and gaskets against the adjacent side walls comprising a pair of jaws each lying against the inner side of one of said free edges, a screw between and paralleling said jaws, nuts threaded on said screw, and toggle arms pivotally coupling the nuts with the jaws.

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