Aug. 24, 1943. W. KASTEN 2,327,648

FILTER PACK

Filed Oct. 17, 1942

FIG. 2.

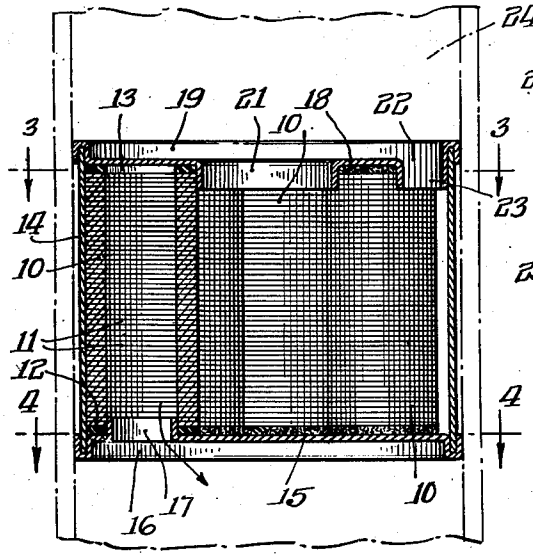


FIG. 1.

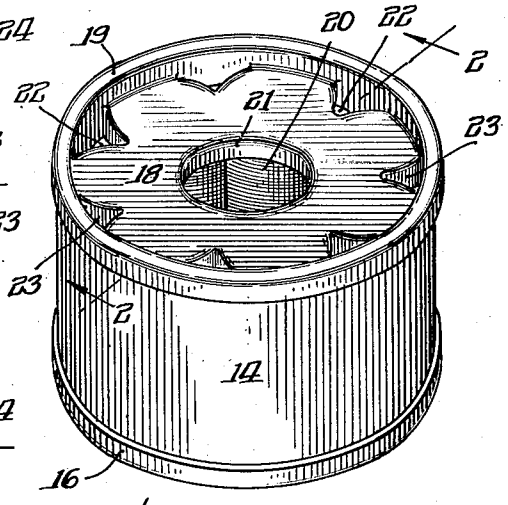


FIG. 5.

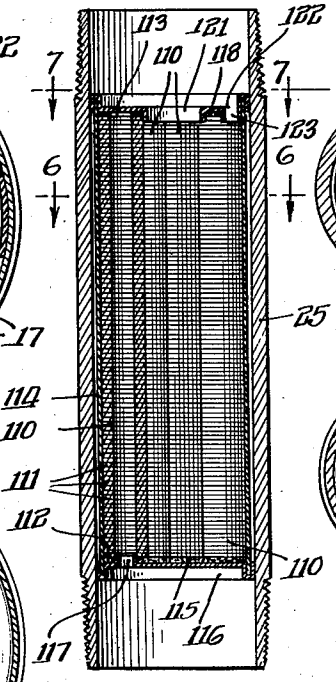


FIG. 3.

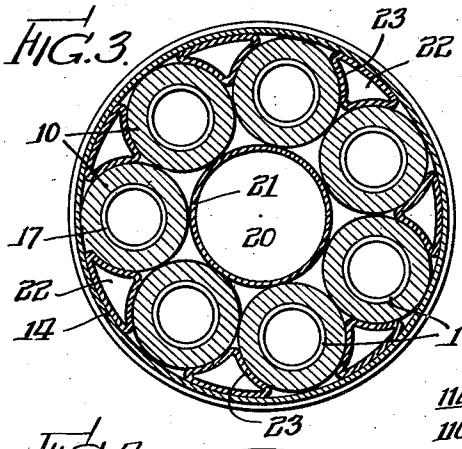


FIG. 6.

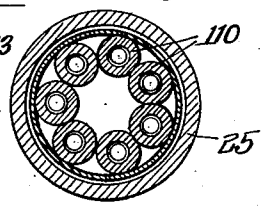


FIG. 7.

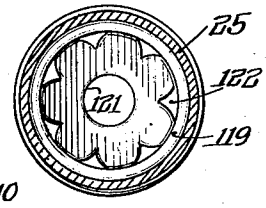
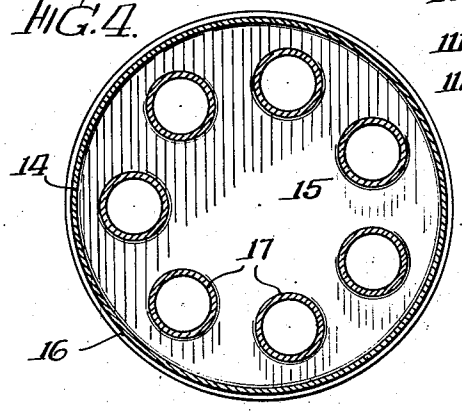


FIG. 4.



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FILTER PACK

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Application October 17, 1942, Serial No. 462,345

5 Claims. (Cl. 210—184)

One of the paramount purposes or aims of the instant invention is the provision of simple, efficient and inexpensive means for mounting and securing in place the filter-packs of edge-filters, each of which packs comprises a stack of layers of paper or equivalent or comparable material in face-to-face engagement with one another, the paper being impregnated or charged with a suitable agent or medium to render it impermeable or unaffected by the fluid undergoing filtration or by any of its contaminants.

In the manufacture of such filter-packs, the superposed or registered, washer-shaped, impregnated paper-discs, or their equivalents, are held pressed together in surface contact during polymerization of said agent with which they are charged with the result that in the final packs such discs are adhered together constituting a unit of united discs, and it is the mounting of such or comparable units which constitutes the subject-matter of this invention.

Heretofore, it has been customary to secure such packs in place by means of metal cores in their internal passages formed by the registered apertures of the discs and an aim of the invention is to avoid the necessity for the use of such cores to reduce the cost of production and to lighten the weight of the packs.

To permit a ready understanding of the principles underlying the new constructions by those interested therein, present preferred embodiments of the invention have been illustrated in the accompanying drawing constituting a part of this specification and, for simplicity, like reference numerals have been used in the several views to designate the same structural parts.

In this drawing:

Figure 1 is a perspective view of one of the complete filter-cartridges;

Figure 2 is a central longitudinal section through such a structure;

Figure 3 is a cross-section through the cartridge on line 3—3 of Figure 2;

Figure 4 is a cross-section through the filter on line 4—4 of Figure 2; and

Figures 5, 6 and 7 are longitudinal and transverse sections through a slightly different embodiment of the invention.

Referring first to the filter-structure of Figures 1 to 4 inclusive, it will be noted that each filter-pack 10 includes the usual series or stack of properly-impregnated, apertured paper-discs 11, 11 in face-to-face adhered relation, each such pack having at one end a resilient, centrally-apertured disc 12 of a suitable material, such for instance as neoprene, the other end of such pack being covered and closed by an unapertured companion disc 13, both such parts 12 and 13 being desirably cemented or adhered to its adjacent paper-disc, each such pack constituting a readily handled unit.

These packs, seven in number in the present instance, are contained in a cylindrical, metal shell or casing 14 with the closed ends of all of the packs near one end of the shell and the open ends of all of the packs contiguous to the other end of the shell.

The end of such shell at the open ends of the packs has a round, concave metal-disc 15 fixed thereto by its hollow, marginal bead 16 receiving the end of the shell and secured thereto frictionally, or by crimping, or otherwise, the main-body of such disc being apertured in register with each of the several packs with inwardly-directed, circular flanges 17, around the apertures and integral with the body of the disc, snugly fitting in the terminal portions of the internal-passages of the packs formed by their registered disc apertures and holding those ends of the packs securely in proper position.

At the other end of the shell is another metal end-member or concave-disc 18 secured to the shell 14 in like manner with its hollow bead 19 receiving and bound or fixed to the end portion of the shell, the main body of such part 18 inside of the shell having a central, round, marginally-flanged aperture 20 with its inwardly-directed flange 21 contacting the outer surfaces of all of the surrounding, circularly-arranged filter-packs, as shown perhaps most clearly in Figure 3.

In order, however, to maintain such terminal portions of the group of packs more securely in position, this metal end-member 18 is substantially-triangularly apertured at 22 between each pair of packs, each such aperture having an inwardly-extended flange 23 of approximately the same shape and size engaging by its intermediate portion the inner surface of the encasing shell or housing 14 and contacting with the other two sections of its flange the outer surfaces of two of the packs.

In each instance the portions of such flanges referred to are desirably curved to conform to the corresponding roundness or cylindricity of the bodies with which they contact.

Thus the closed end of each pack is securely maintained in position by being held in place at four different points, and, of course, the opposite

end of each pack is secured in proper position by the means specified hereinbefore.

It is to be understood that the parts of the filter-packs are held pressed together longitudinally of such bodies, and with the needed or desirable compression of the resilient end-discs, between the two end-members **15** and **18** which are located at such a distance apart as to produce this befitting result.

Assuming that the filter-cartridge is housed in a conduit **24** shown by dotted lines in Figure 2, the fluid to undergo filtration is caused, either by the application of suction or pressure, to enter the filter through the plurality of apertures **20** and **22**, and to flow inwardly through the plurality of filter-packs into and to be discharged through their several central passages.

Or, if preferred, the course or direction of the flow could be reversed.

In Figures 5, 6 and 7, there has been illustrated a filter of this general type, but of sufficiently small caliber for facile introduction into a compressed-air hose-line, the filter-cartridge being incorporated in a tubular connection **25** with the ends of which the sections of hose may be readily connected.

This filter has been supplied with reference numerals 100 greater than the corresponding or answering ones employed in the other figures.

In this case the filter-cartridge may be mounted in the connector in any suitable manner, as by merely a friction press fit therein as will be readily understood.

Those skilled in this art will know that this invention, as defined by the appended claims, and as described and illustrated, is not limited and confined to the precise and exact details of structure referred to and that these may be modified or changed in reasonable measure without departure from the heart and essence of the invention and without the loss or sacrifice of any of its substantial benefits and advantages.

I claim:

1. In an edge-filter cartridge, having a casing containing a plurality of parallel filter-packs each having an internal passage open at least at one end and means for holding said filter-packs in place, the novel features being that said holding-means includes a member fixed to said casing and having a flanged opening therethrough in register with each of the filter-packs and with its flange snugly occupying the end portion of said filter-pack passage, and a second-member fixed to said casing and overlying the opposite ends of said filter-packs and having a plurality of flanged apertures therethrough outside of said packs and with their flanges engaging and positioning the external surfaces of said filter-packs, whereby the fluid to be filtered may flow through one of said members, through the walls of said filter-packs into their internal passages, and from the latter through the openings of said other member.

2. The novel features in edge-filter cartridge filter-pack holding-means set forth in claim 1, in which said casing is cylindrical and in which each of said filter-packs contacts the wall of said casing internally.

3. The novel features in edge-filter cartridge filter-pack holding-means set forth in claim 1, in which said casing is cylindrical, in which each of said filter-packs externally contacts the wall of said casing internally, and in which said second member has a central flanged aperture, the flange of which externally contacts with said filter-packs.

4. The novel features in edge-filter cartridge filter-pack holding-means set forth in claim 1, in which said casing is cylindrical, and in which the flange of each aperture of said second member has curved portions engaging the inner surface of said casing and engaging the external surfaces of two adjacent filter-packs.

5. The novel features in edge-filter cartridge filter-pack holding-means set forth in claim 1, in which said casing is cylindrical, in which each of said filter-packs externally contacts the wall of said casing internally, in which said second member has a central flanged opening, the flange of which externally contacts with said filter-packs, and in which the flange of each said aperture of said second member has curved portions engaging the inner surface of said casing and engaging the external surfaces of two adjacent filter-packs.

WALTER KASTEN.