Sept. 16, 1941. G. F. McNAMARA 2,255,937

FILTER

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FIG. 1.

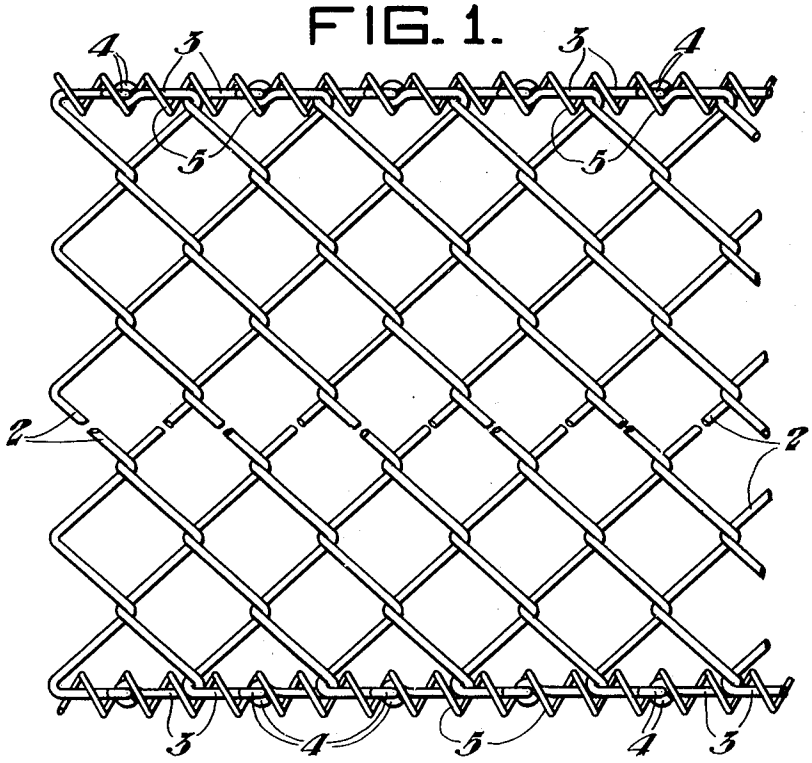


FIG. 2.

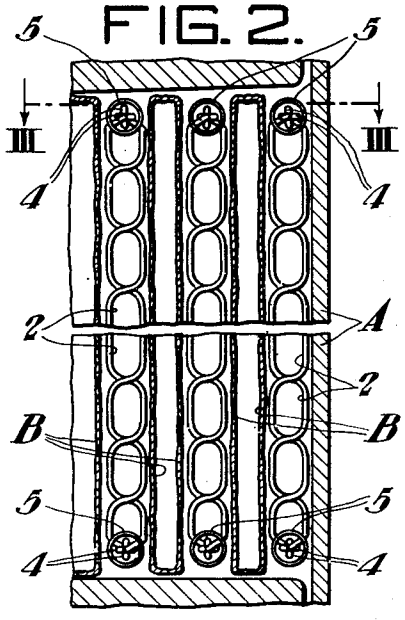
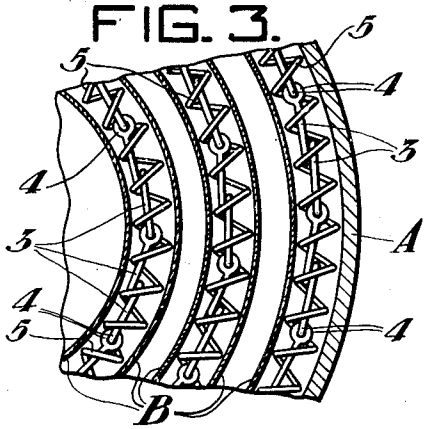


FIG. 3.



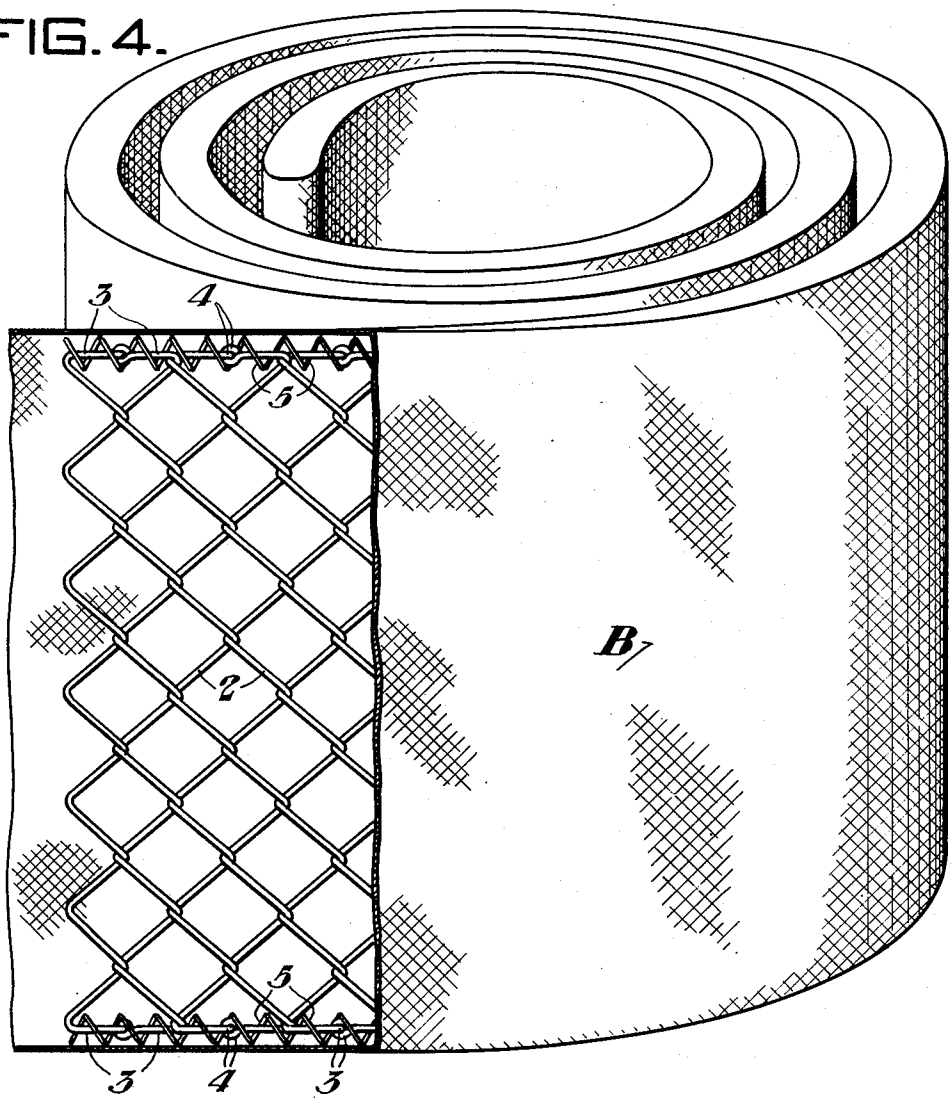
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FIG. 4.



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UNITED STATES PATENT OFFICE

2,255,937

FILTER

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Application October 19, 1939, Serial No. 300,247

4 Claims. (Cl. 210—181)

This invention relates to filters and, more particularly, to filters such as are widely used for the reclamation of used lubricating oils, although not limited thereto.

At the present time, there are available a number of devices in the form of filters which comprise coiled wire mats, the convolutions of which carry lengths of fabric. This fabric is usually in the form of a bag into which one end of the wire mat is inserted prior to the coiling thereof. The coiled wire mat functions as a spacer unit for the strips of the fabric bags.

The fabric bag will not stand upright and support itself. If it is not made to stand upright so that the oil must go through it under pressure and deposit all dirt or other matter in solution on the fabric and thus become a clean oil when it leaves the filter, the entire value of the filter is lost.

Accordingly, the fabric bag needs some stiffer supporting membrane with open mesh to permit passage of the liquid into the fabric and one which at the same time will expand and collapse under pressure, just as the bag expands and collapses under the same pressure. This membrane must be sufficiently rigid to hold the bag upright, either under pumping pressure or without pressure.

When the filter is under pressure, the fabric bag expands and stretches. As it expands, it creeps slightly over the top and under the bottom of the wire spacer mat. After this expanding, when the pressure is turned off, the fabric bag collapses. If there are cut wire ends exposed at the edge of the mat (at either top or bottom) when the fabric bag creeps past these wire ends under pressure, or falls back when the pressure is turned off, the fabric will catch and tear on the wire ends.

When the raw edges of the wire mat spacer units puncture the cloth or fabric filter bag, there is provided one or more openings through which the filtered oil drains downwardly after it has passed through the cloth or fabric bag.

It is among the objects of the present invention to provide a filter which comprises the conventional fabric bag together with a wire mat spacer unit therefor which is so constructed and arranged as to not only provide the proper spacing but also to enable the rapid and easy changing of the cloth or fabric filter bags without danger of puncturing the latter.

Another object of the present invention is the provision of a device of the type referred to hereinbefore which is extremely easy and inexpensive to manufacture and one which is very durable in service.

The foregoing and other objects will be apparent after referring to the drawings, in which:

Figure 1 is a fragmentary elevation of the wire mat spacer unit of the present invention;

Figure 2 is a fragmentary sectional elevation of an oil filter embodying the wire mat spacer unit of Figure 1;

Figure 3 is a sectional view on the line III—III of Figure 2; and

Figure 4 is a perspective of a convoluted cloth bag enclosing the wire mat spacer unit of Figure 1.

Referring more particularly to Figures 1 and 2 of the drawings, the numeral 2 designates the wire fabric which is preferably, although not necessarily, of uni-directional weave.

As will be noted in Figure 1 of the drawings, the ends of the adjacent coils of the fabric 2 are bent at substantial right angles, as shown at 3, and connected with complementary instrumentalities on the next adjoining coil by the use of integral hooked or eye portions 4. It is these hooked or eye portions 4 which provide jagged wire ends which puncture the cloth or fabric bag of the filter. When extreme care is taken to prevent such puncturing, the installation of the cloth or fabric filter bag over the wire mat spacer unit is a tedious operation.

According to the teaching of the present invention, a simple helical wire coil 5 is threaded over the entireties of the bent portions 3 of the helical coils of the fabric 2 and also the hooked or eye portions 4 which connect adjacent complementary parts. This wire coil 5 is simply rotated into position over the elements 3 and 4 in the manner shown in the drawings. By the use of the helical wire coils 5, I protect both of the side edges of the wire mat spacer unit 2 whereby the same may be speedily inserted into the cloth or fabric filter bag without danger of puncturing the latter.

The wire mat spacer unit with its edges protected is then inserted into the cloth or fabric filter bag, after which the filter bag is coiled and inserted in the filter compartment. The filter is then ready for service. When using a conventional wire mat spacer unit in which the edges are unprotected, the coiling of the cloth or fabric filter bag with such a wire mat spacer unit disposed interiorly thereof causes the bent portions 3 of the coils of the fabric, and also the hooked or eye portions 4, to move outwardly and puncture the cloth or fabric filter bag. This

difficulty is eliminated by the practice of the present invention.

In Figures 2 and 3 of the drawings, the wire fabric spacer unit 2 is shown as disposed in an oil filter compartment A between the convolutions of a cloth or fabric filter bag B. In Figure 4, the wire mat spacer unit 2 is shown as disposed within the envelope afforded by the cloth or fabric filter bag B. In both cases the wire fabric spacer unit 2 functions in the advantageous manner referred to hereinbefore.

While I have shown and described one specific embodiment of my invention, it will be understood that this embodiment is merely for the purpose of illustration and description and that various other forms may be devised within the scope of my invention, as defined in the appended claims.

I claim:

1. A filter comprising, in combination, a wire mat and a cloth bag enveloping said wire mat, at least one of the longitudinal edges of said wire mat being enclosed by a helically coiled wire, said wire mat and said cloth bag being coiled to provide separated cloth walls for penetration by the medium to be filtered.

2. The method of making filters which comprises weaving a wire mat, threading a helically coiled wire onto at least one of the longitudinal edges of said wire mat, inserting said wire mat in a cloth bag, coiling said cloth bag and the interiorly disposed wire mat, and disposing the coiled cloth bag and wire mat in a filter compartment.

3. A filter comprising a wire mat, at least one of the longitudinal edges of said wire mat being enclosed by helically coiled wire, said wire mat being convoluted, and a fabric element disposed between the convolutions of said wire mat.

4. The method of making filters which comprises weaving a wire mat, threading a helically coiled wire onto at least one of the longitudinal edges of said wire mat, convoluting said wire mat with an adjacently disposed cloth bag and disposing the convoluted wire mat and cloth bag in a filter compartment.

GEORGE F. McNAMARA.