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1,580,291

L. L. DOLLINGER

FILTER

Filed Feb. 21, 1925

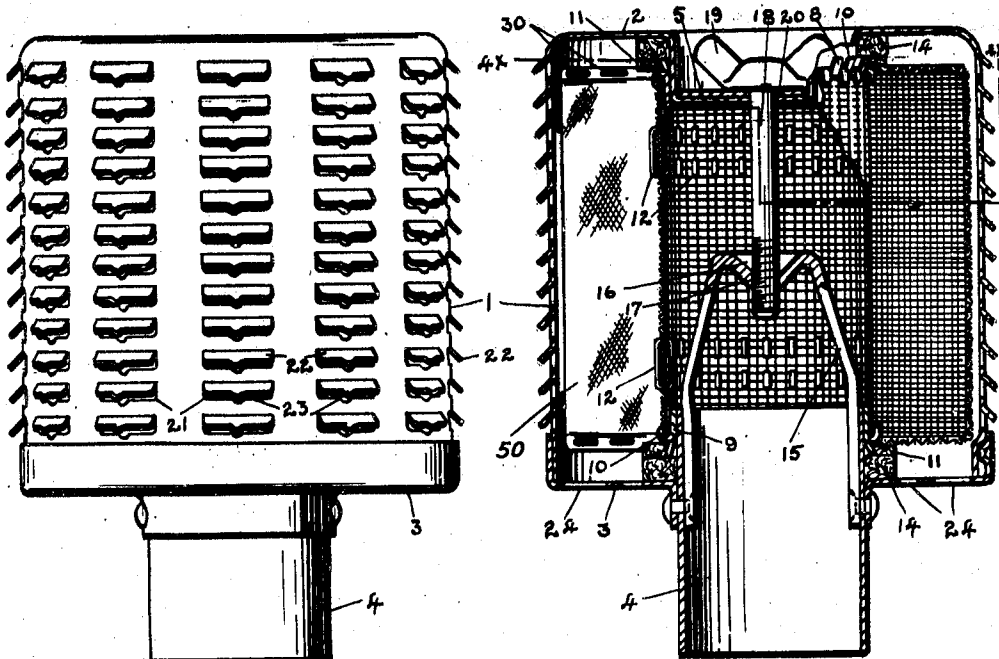


FIG. 1

FIG. 2

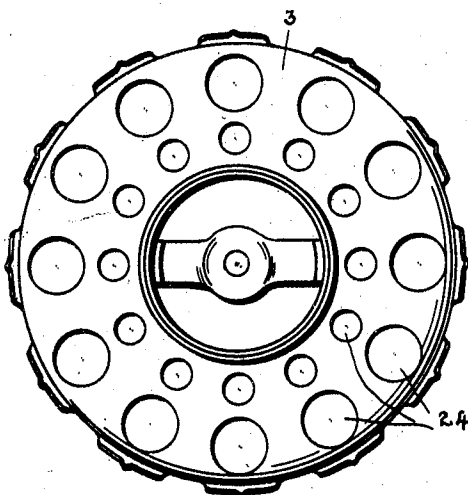


FIG. 3

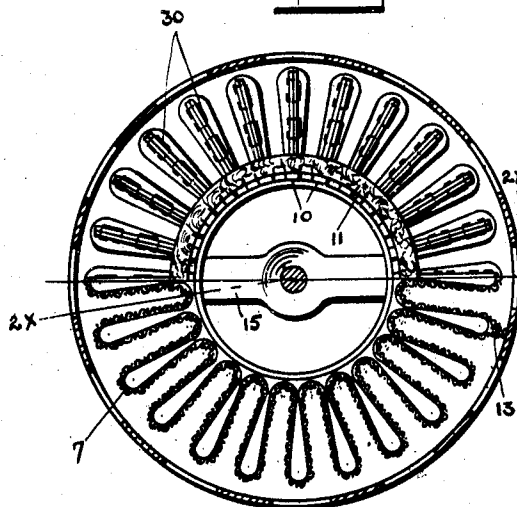


FIG. 4

Inventor

Lewis L. Dollinger

By

Frank Keiper

Attorney

## UNITED STATES PATENT OFFICE.

LEWIS L. DOLLINGER, OF ROCHESTER, NEW YORK.

## FILTER.

Application filed February 21, 1925. Serial No. 10,963.

To all whom it may concern:

Be it known that LEWIS L. DOLLINGER, citizen of the United States, residing at Rochester, in the county of Monroe and State of New York, has invented certain new and useful Improvements in Filters, of which the following is a specification.

The object of this invention is to provide an air filter of improved construction for use with internal combustion engines, air compressors, etc., to clean the air entering the intake of these machines.

This and other objects of this invention will be fully illustrated in the drawing, described in the specification and pointed out in the claims at the end thereof.

In the accompanying drawing:

Figure 1 illustrates the filter in elevation.

Figure 2 is a vertical cross sectional view of the filter, the section being taken on the line 2\*-2\* of Figure 4.

Figure 3 is a top plan view of the filter.

Figure 4 is a horizontal sectional view of the filter, the section being taken on the line 4\*-4\* of Figure 2.

In the several figures of the drawings like reference numerals indicate like parts.

Air engines such as internal combustion engines, air compressors, etc., fill their cylinders with air at every stroke and when the air drawn into the cylinder carries with it dust and other foreign matter it causes wear and decreases the efficiency and shortens the life of the engine. The filter forming the subject matter of this invention is constructed in the most practical manner so as to make it adaptable to both large and small engines, or wherever it is desirable to protect an engine against wear due to the above mentioned cause. The filter is also adaptable for cleaning the air entering and passing thru electric motors, pipe organs, buildings in fact any installations where clean air is desirable.

As illustrated in the drawing, the filter comprises a shell 1 which as illustrated in the figures is preferably cylindrical in shape. This shell has the head 2 formed integral with it to provide the top for the

filter. A second head 3 is formed separately and is adapted to telescope over the open bottom of the shell 1. In the head 3 is provided the outlet of the filter which comprises the sleeve 4 and is centrally mounted in the head 3 and projects inwardly and outwardly therefrom. In the head 2 is formed a depression 5 providing a centering, and supporting lug on the inside of the shell between which and the inwardly projecting portion of the sleeve 4 the filtering unit proper is held in place.

The filtering unit comprises a screen 7 having radially projecting folds. The screen 7 is made up of a single piece of screen and is folded as illustrated in Figure 4 with the inner ends of the folds brought together to form a series of radial pockets. The inner ends of the pockets of the radial screen 7 are fastened together at the top and bottom by a pair of binding rings 8 and 9. Each of these binding rings has its outer edge slit so as to form a series of prongs 10, 10. Every alternate prong thus formed on the outer edge of the binding rings is turned down on the outside and projects between one of the folds of the radial screen 7, it being understood that there are twice as many prongs formed on the outer edge of each of the binding rings as there are radial folds provided in the radial screen 7. The odd numbered prongs 10 are turned down between the folds clamp the radial sections of the screen 7 to the binding rings 8 and 9 while the even numbered prongs 10 are left undisturbed and project endwise from the binding rings, and each forms a mutilated cylindrical flange on which a felt washer 11 is centered at each end of the screen.

The folds of the radial screen are covered with a sheet of felt 50 that is placed on the outside of the screen and between the radial folds so as to cover and conform to the sinuous outline of the whole of the screen. The felt at the bottom of each outside pocket is stapled directly to the screen at 12, 12 so that the felt is drawn closely over each pocket of the screen and extends inward radially to the full depth of each outside

pocket. The two free ends of the web of felt are stapled together at their meeting point as illustrated in Figure 4 at 13. To close the folds of the screen at each end of each pocket, that is at the top and bottom thereof, the web of felt covering the screen is stapled together over the open ends of the folds of the screen as illustrated at 30, 30 at the left of Figure 2 and the upper position of Figure 4. This closes the open ends of the folds of the radial screen so that the whole of the surface of each of the radial screens or pockets is covered with the web of filtering materials. Stapling the felt over the ends of the folds as described closes the ends very effectively as the staples are applied with pressure which firmly presses the edges of the filtering material together.

The felt washers 11 are centered on the mutilated outer flanges of the binding rings 8 and 9 after the felt covering is applied to the radial screens and project over the inner ends of the folds of the screen. This closes any small opening in the ends of the filtering unit that may have been left open by the sheet of felt in covering the inner ends of the folds of the radial screen.

Both the depression 5 in the head 2 and the inwardly projecting portion of the sleeve 4 have a felt washer 14 mounted thereon and placed against the inside of the heads 2 and 3 respectively. These washers form a cushion for the central cylindrical ends of the filtering unit above described. These ends are formed by the binding rings 8 and 9 surrounded by the felt washer 11 and telescope over the depression 5 in the head 2 at the top, and the inwardly projecting portion of the sleeve 4 at the bottom of the inside of the shell.

In the inside of the sleeve 4 is mounted a yoke 15 which is adapted to project into the inside of the filtering unit and has the conical depression 16 provided on the upper end thereof. A hole 17 passes thru the bottom of this depression and is threaded to receive the threaded end of the bolt 18.

The bolt 18 passes thru an opening in the depression 5 of the head 2 and carries a thumb nut 19 at the outer end by which it may be turned to thread it into the hole in the end of the yoke 15. A washer 20 is preferably placed below the thumb nut of the bolt so that its pressure is equally distributed over the whole of the area of the depression.

As the bolt 18 is threaded into the yoke 15 the head 3 with its sleeve 4 is drawn up against the lower edge of the shell 1 while the ends of the filtering unit are forced against the washers 14 until the filtering unit is held clamped in place between the head 2 and 3 of the shell. In this way the felt washers 11 provided at the ends of the filtering units are forced against the felt

washers 14 to form a dust proof joint between the filtering unit and the inside of the shell surrounding the filtering unit.

The wall of the shell is perforated by a series of elongated openings 21, 21 arranged in vertical parallel rows extending practically the full length of the shell. These openings have downwardly inclined tongues 22 projecting over them so as to prevent solid matter dropping on the shell from passing through the openings. These tongues also form individual water sheds for each of the openings which they overlap as they deflect the water dropping on them or running down on the outside of the shell. The point 23 formed on each of the tongues serves to collect the water on the tongues and draws it to the middle thereof and thus causes it to drop off from but one point on the edge of the tongue instead of from the whole length of the edge thereof.

In the lower head 3 of the filter are provided series of holes 24 thru which the foreign matter separated from the air in passing thru the filtering unit can drop out of the shell as it drops off from the outside of the filtering unit.

I claim:

1. In an air filter, the combination of a shell, a filtering unit mounted within said shell, means for centering said filtering unit at the top and bottom of said shell, and means for drawing said filtering unit against said centering means mounted centrally of said shell and passing thru said filtering unit, a felt washer carried on the ends of said filtering unit and felt washer provided on the inside of said shell surrounding said centering means to form a dust proof joint between the inside of said filtering unit and the inside of said shell.

2. In an air filter, the combination of a filtering screen comprising radially projecting folds, a flexible filtering cover embracing the outside of said radially projecting folds and means for drawing, clamping and sealing the ends of said filtering cover over the open ends of said radial folds.

3. In an air filter, the combination of a shell having a head formed integral at one end thereof and a removable head provided on the other end thereof, a centering lug provided on said integral head on the inside of said shell and a sleeve mounted centrally of said removable head, a filtering unit comprising a screen having radially projecting pockets or folds, a binding ring provided at each end of said screen, prongs formed on said binding ring, said prongs being alternately left to project from said screen and bent out and over the inner end of said radially projecting folds of said screen, a continuous sheet of filtering material placed over said screen and between the radially projecting folds thereof, the ends of said

sheet of filtering material being clamped together at each end of said radially projecting folds and forming pockets surrounded by filtering material and leading to said  
5 cylindrical screen.

4. In an air filter, the combination of a filtering unit comprising a screen having an opening at each end and having radially projecting folds grouped around the open-

ings, a binding ring mounted in each end 10 of the opening in said screen, said binding rings having prongs formed thereon to engage between said radially projecting folds and hold them grouped in a predetermined position with relation to the open ends of 15 said screen.

In testimony whereof I affix my signature.

LEWIS L. DOLLINGER.