

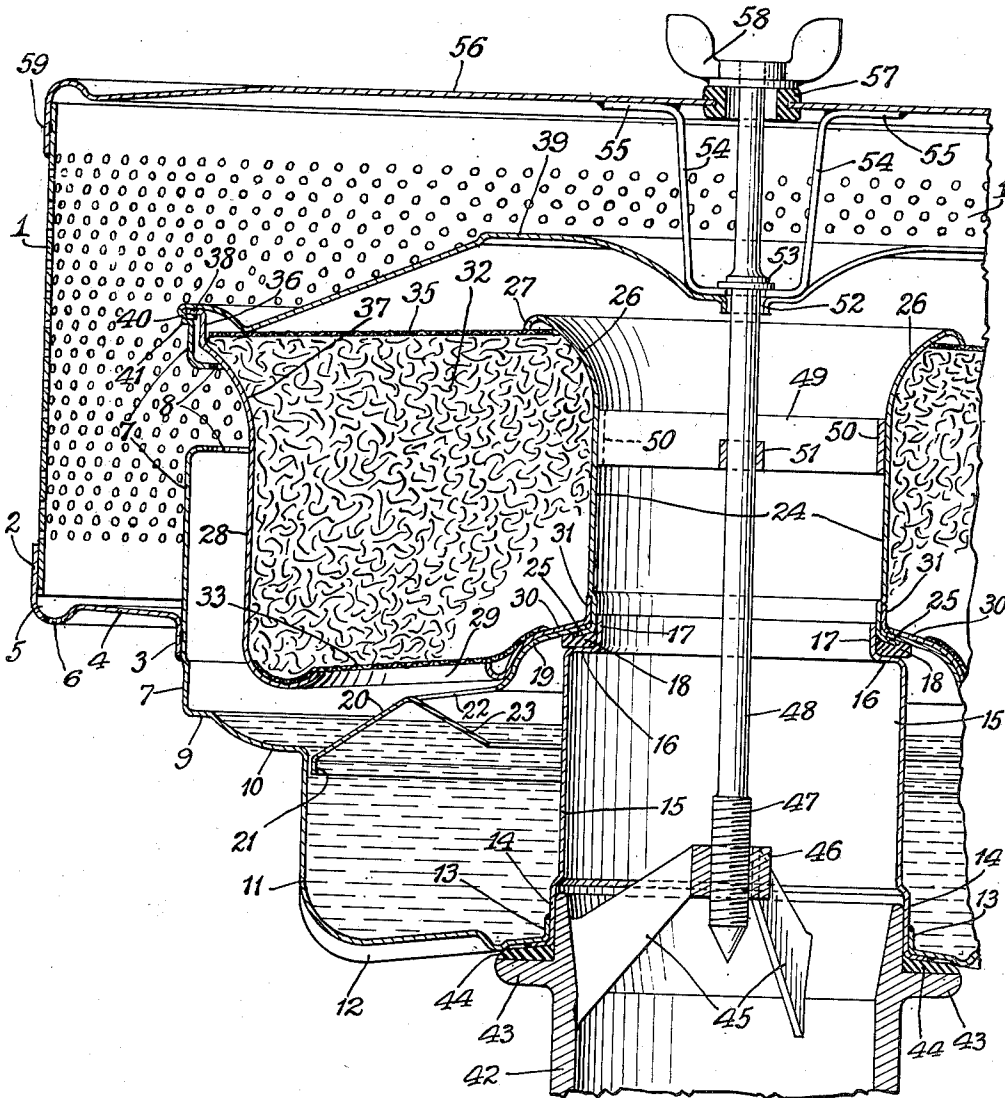
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COMBINATION AIR CLEANER AND CHAFF SCREEN

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COMBINATION AIR CLEANER AND CHAFF
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This invention relates to a combined air cleaner and chaff screen.

It has for one object to provide a construction in which air cleaning means are combined with a so-called chaff screen, the purpose of which is to separate from the inwardly moving column of air or gas the larger and coarser particles of foreign matter of any shape. Although, as the name implies, chaff and relatively flat, extended particles of material will be readily separated, the device will also separate material of substantial size, irrespective of its shape.

Another object is to provide, in combination with an oil bath air cleaner, means for separating relatively large particles, such as chaff, from the inwardly moving column of air before it reaches the air cleaner proper, and to provide these means in a single unitary cleaner assembly.

Other objects will appear from time to time in the specification and claims.

The invention is illustrated more or less diagrammatically in the accompanying drawing, wherein:

The sole figure is a vertical, sectional view through one form of the device.

Like parts are indicated by like characters in the specification and drawing.

In the particular form here shown, the invention is embodied in an oil bath air cleaner to which is added an outer screen in such a manner as to comprise a compact unit or unitary assembly. By this means efficient operation is assured and a substantial saving of space is accomplished.

The outer screen 1 is preferably formed of perforated sheet material and may be formed of perforated sheet metal, the perforations of which are small enough to exclude particles of chaff and other relatively large foreign matter which would otherwise tend to clog the filter and to interfere with satisfactory operation of the oil bath air cleaner.

A ring-like member 2 is positioned to engage the lower end of the screen 1 and to slide into it. It is preferably integral with a ring-like member 3 and is joined to it by a continuous member 4 which is shaped to provide an annular depression or groove 5. One or more perforations 6 are formed in the groove 5.

The oil bath cleaner proper comprises an outer casing 7 which is shaped to provide a plurality of openings 8. These are arranged about the periphery of the member 7 and provide, in effect, an annular inlet. Adjacent its lower edge, the member 7 is shaped to provide a shoulder 9. It is inwardly and downwardly curved, as at 10, to

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provide, in effect, a second shoulder, and it is finally inwardly and downwardly shaped, as at 11, to provide a relatively deep and cup-like portion. This cup-like portion may be shaped to provide a plurality of stiffening ribs 12, if desired.

At its inner end, the cup member is provided with an upwardly extending cylindrical portion 13 which is secured by welding, or otherwise, to an outlet passage forming member 14, which may be provided with an integral portion of reduced diameter 15. The member 15 is shouldered, as at 16, and provided with a further reduced portion 17.

A gasket or sealing member 18 is positioned upon the shoulder 16 and supports a baffle member, which comprises an inner concavo-convex portion 19. Integral with this portion is an outwardly and downwardly inclined portion 20 which terminates in a peripheral downwardly directed flange 21. A plurality of louvres or openings 22 is formed in the baffle member, and adjacent each louvre is positioned a downwardly and inwardly directed, inclined portion 23 which is formed of material inwardly and downwardly displaced when the louvres 22 are formed.

A filter body is supported upon the shoulder 16 and is positioned upon the shoulder 16 and is positioned above the baffle member 19. The filter body is bounded by an inward tubular member 24 which forms a continuation of the outlet passage 15 and is slightly telescoped with regard to that passage. The member 24 is provided with a flange 25 adjacent its bottom and the baffle portion 19 rests upon the flange 25. The member 24 is outwardly flared at 26 at its upper end, and is provided with a downwardly bent lip 27 at its periphery. The shell which completes the filter-containing member comprises an annular part 28 provided with a plurality of spoke-like members 29 which are integral with a ring-like portion 30 positioned upon the baffle portion 19 and terminating in an upwardly extending tubular section 31 which is in contact with and secured to the member 24. Thus, the members 24 and 28 form together an annular enclosing means within which is positioned a filter mass 32. This filter mass is formed of any desired material and may comprise metal, wool, synthetic material, natural hair or wool, or a mixture of any of these. Positioned generally at the bottom of the member 28 is a screen 33 which rests upon the spokes 29 and supports the filter mass 32. The upper surface of the filter mass is held in place by a screen member 35 which, at its inner portion, extends beneath the lip 27 and contacts the

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flared portion 26 of the tubular member 24. At its outer edge, the screen 35 approaches or contacts the upper portion 36 of the member 28, which may, if desired, be outwardly flared, as at 37. The portion 36 terminates in an outwardly directed flange 38.

A cover plate 39 is positioned to overlie the filter body and the parts which enclose it, and at its outer edge is inwardly bent, as at 40, to engage the flange 38 of the shell 28. The flange 40 rests upon the upper edge of the member 7, which may be defined by an outwardly bent flange 41, as shown, although this flange is not necessary.

A cleaner of the type shown is normally positioned upon a carburetor or upon a member connected to a carburetor so that air passing through the cleaner and emerging cleaned is directed to the carburetor. As shown, the member 42 may be considered the inlet passage to a carburetor. It is preferably provided with a laterally directed, outwardly projecting flange 43 upon which a gasket 44 may be positioned. The cleaner is positioned about the upper end of the passage 42 and is supported by the flange 43 and rests upon the gasket 44. The member 42 is provided with legs 45 which are joined as at 46 to an inwardly threaded member into which the threaded portion 47 of a stud 48 is received. A stud guiding and supporting member 49 may be positioned within the conduit portion 24. The member 49 extends transversely of the conduit and is provided at its ends with laterally bent portions 50 which are secured to the portion 24. The member 49 is shaped, as at 51, to receive and to provide a bearing for the stud. The stud passes through a perforation 52 in the cover plate 39 and is provided with a shoulder 53. A stirrup 54 fits freely about the stud and is positioned beneath the shoulder 53. At its upper ends, as at 55, the stirrup is secured to an over-all cover plate 56. The stud passes freely through a perforation in the plate 56 and through the opening in a gasket or sealing member 57 fixed in the cover plate 56. The stud carries at its upper end a thumb nut 58, by means of which it may be rotated. The cover plate 56 is provided adjacent its outer edge with a downwardly directed flange 59 which embraces the upper edge of the screen 1 and is secured to it by welding or otherwise.

Although I have shown an operative form of my invention, it will be recognized that many changes in the form, shape and arrangement of parts can be made without departing from the spirit of the invention, and my showing is, therefore, to be taken as, in a sense, diagrammatic. The use and operation of this invention are as follows:

The device in the form generally shown may be mounted upon a carburetor or upon any conduit means through which cleaned air is to be directed to a point of use or treatment. Such conduit means will ordinarily include members, such as the flange 43, for positioning the cleaner, and also members, such as the part 46, by means of which the cleaner assembly may be secured in place.

To separate the cleaner into its component parts for filling, cleaning or washing, the following steps are carried out:

The stud 48 is backed off and disengaged from the member 46. It is then raised and the over-all cover plate 56 may be raised. When the cover plate is raised, it carries with it the screen member 1 which is secured to it, thus releasing the

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stirrup 54 from contact with the cleaner cover plate 39. The cover plate 39 may be raised and carries with it, when thus raised, the filter body, including the filter mass 32, the shell 28 and the outlet passage member 24, and also the screen portions 33 and 35, as well as the baffle member 19, 20. The separation just described may leave the cup member 11 in place about the outlet conduit 42, and the rings 2 and 3 and associated parts will remain in place because they are fixed to the shell 7.

From the foregoing description of the separation of the parts, it is clear that the stud 48 holds the oil cup assembly and the filter mass assembly of the oil bath cleaner together, and also holds the chaff screen in place. The stud further acts to hold the entire assembly in place upon the conduit member 42. Therefore, when the stud is in the position shown in the figure, all of the parts of the assembly are held firmly together in proper assembled position, and the cleaner assembly as a whole is held in proper position upon the conduit 42. When the stud is disconnected from the member 46, the cleaner as a whole may be removed from the conduit 42, and the three main portions of the cleaner; namely, the chaff screen, the filter body and the oil cup, may be separated for cleaning, repair, adjustment or other purposes.

It is necessary from time to time to clean the filter body by washing, and that may be done when the parts have been separated as described. It is also necessary from time to time to replenish or replace the oil or other liquid which is normally within the cleaner, and that, also, may conveniently be done when the parts are separated as above described. When the stud is no longer engaged with the member 46, the cup portion 7, 11 may be readily lifted from the flange 43 and its contents emptied for replacement, and it may be cleaned by washing or otherwise. Thereafter, when it is again put in an upright position, its oil or other liquid is replenished and the parts are reassembled into the position of the figure and the device is again ready for use.

In an oil bath cleaner of the type shown, liquid is normally put into the cup and usually oil is used. It is shown in position in the figure and it stands at the level at which it will ordinarily stand when the device is not in use; that is to say, when air or other gas is not being drawn through the cleaner. When the cleaner is in use and air is passing through it, some of the liquid rises from the cup and moves into the filter mass. The amount of liquid which moves into the filter mass during operation varies with the rate of gas or air flow through the cleaner.

I claim:

1. In combination in an air cleaner, members defining an oil cup, members defining a filter assembly and members defining a chaff screen, and a single fastening member adapted in one position to hold said oil cup, said filter assembly and said chaff screen in predetermined position for use.

2. In combination in an air cleaning assembly, a member defining an oil cup and including a tubular air outlet member, a filter housing including an outer portion, said filter assembly including a tubular air outlet passage member adapted to cooperate with said first mentioned air outlet passage member to form therewith a continuous outlet passage member through which air leaves the cleaner, a cover plate positioned to overlie said air cleaner and positioned above said

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air outlet passage member, a chaff screen positioned outwardly from said oil cup, a member secured to said oil cup and positioned to engage said chaff screen, a cover plate secured to said chaff screen and overlying the area bounded by said chaff screen, a joining means comprising a part positioned within said air outlet passage extending through said air cleaner cover and extending through said chaff screen cover, and means for moving said joining means to hold said oil cup, said filter housing, and said chaff screen and its cover in predetermined assembled position.

3. In combination in an air cleaning assembly, a member defining an oil cup and including a tubular air outlet member, a filter housing including an outer portion, said filter assembly including a tubular air outlet passage member adapted to cooperate with said first mentioned air outlet passage member to form therewith a continuous outlet passage member through which air leaves the cleaner, a cover plate positioned to overlie said air cleaner and positioned above said air outlet passage member, a chaff screen formed of perforated material positioned outwardly from said oil cup, a member secured to said oil cup and positioned to surround and engage said chaff screen, a cover plate permanently secured to said chaff screen and overlying the area bounded by said chaff screen, a single joining means comprising a part positioned within said air outlet passage extending through said air cleaner cover and extending through said chaff screen cover, and means for moving said joining means to hold said oil cup, said filter housing, and said chaff screen and its cover in predetermined assembled position.

4. In combination in an air cleaning assembly, a member defining an oil cup and including a tubular air outlet member, a filter housing including an outer portion, said filter assembly including a tubular air outlet passage member adapted to cooperate with said first mentioned air outlet passage member to form therewith a continuous outlet passage member through which air leaves the cleaner, a cover plate positioned to overlie said air cleaner and positioned above said air outlet passage member, a chaff screen positioned outwardly from said oil cup, a member secured to said oil cup and positioned to engage said chaff screen, a cover plate secured to said chaff screen and overlying the area bounded by said chaff screen, a joining means comprising a part positioned within said air outlet passage extending through said air cleaner cover and extending through said chaff screen cover, a stirrup-like member fixed to said chaff screen cover and adapted to contact said cleaner cover, and means for moving said joining means to hold said oil cup, said filter housing, and said chaff screen and its cover in predetermined assembled position.

5. In combination in an air cleaning assembly, a member defining an oil cup and including a tubular air outlet member centrally thereof, a filter housing including an outer portion adapted, when the filter housing is assembled within the oil cup, to form therewith an annular air inlet passage, said filter assembly including a tubular air outlet passage member adapted to cooperate with said first mentioned air outlet passage member to form therewith a continuous

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outlet passage member through which air leaves the cleaner, a mass of filter material within said filter housing, means above and below said filter material for confining the same within said filter housing, a cover plate positioned to overlie said air cleaner and secured permanently to the filter housing and positioned above said air outlet passage member, a chaff screen formed of perforated material positioned outwardly from said oil cup, a member secured to said oil cup and positioned to surround and engage said chaff screen, a cover plate permanently secured to said chaff screen and overlying the area bounded by said chaff screen, a single joining means comprising a threaded stud positioned within said air outlet passage extending through said air cleaner cover and extending through said chaff screen cover, a stirrup-like member fixed to said chaff screen cover and adapted to contact said cleaner cover, and means for moving said joining means to hold said oil cup, said filter housing, and said chaff screen and its cover in predetermined assembled position.

6. In combination in an air cleaning assembly, a member defining an oil cup and including a tubular air outlet member centrally thereof, a filter housing including an outer portion adapted, when the filter housing is assembled within the oil cup, to form therewith an annular air inlet passage, said filter assembly including a tubular air outlet passage member adapted to cooperate telescopically with said first mentioned air outlet passage member to form therewith a continuous outlet passage member through which air leaves the cleaner, a mass of filter material within said filter housing, means above and below said filter material for confining the same within said filter housing, a cover plate positioned to overlie said air cleaner and secured permanently to the filter housing and positioned above said air outlet passage member, a chaff screen formed of perforated material positioned outwardly from said oil cup, a member secured to said oil cup and positioned to surround and engage said chaff screen, a cover plate permanently secured to said chaff screen and overlying the area bounded by said chaff screen, a single joining means comprising a threaded stud positioned within said air outlet passage extending through said air cleaner cover and extending through said chaff screen cover, a stirrup-like member fixed to said chaff screen cover and adapted to contact said cleaner cover, and means for moving said joining means to hold said oil cup, said filter housing, and said chaff screen and its cover in predetermined assembled position.

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