A container device having both a silencer chamber and an air filter chamber disposed within it and inlet and outlet conduits to each chamber and the two chambers compliment each other by the filter chamber providing acoustic qualities for the silencer chamber and the silencer chamber providing harmonic vibration to the filter chamber for filter cleaning assistance.
FIG. 4

Baffle 16

Sound absorbing acoustic material 17

Filter 20

Silencer

Heat exchanger 18
VACUUM PUMP FILTER SILENCER COMBINATION

FIELD OF THE INVENTION

[0001] The present invention relates to the field of air blower’s and compressor’s need to filter air before it enters the blower or compressor and the need to silence the sound emitted from air exiting the blower or compressor. More particularly, the present invention relates to a container device having both a silencer chamber and an air filter chamber disposed within it and inlet and outlet conduits to each chamber. The two chambers complement each other by the filter chamber providing acoustic qualities for the silencer chamber and the silencer chamber providing harmonic vibration to the filter chamber for filter cleaning assistance.

BACKGROUND OF THE INVENTION

[0002] Air compressors and air blowers commonly have a fixed replaceable filter installed prior to its inlet and sometimes a muffler is placed on its air outlet. The two operate independent of each other.

SUMMARY OF THE INVENTION

[0003] It is therefore an objective of the present invention to provide a common container to house both the inlet air filter chamber and the discharge air silencer chamber. This common container condenses the area needed to house the filter and silencer and allows complementary qualities of each to assist the other. The sound emitted from the air exhaust is transmitted as vibrations or harmonics, which are used to vibrate a filter thus vibrating debris off the surface of the filter. This creates a self-cleaning filter system.

[0004] Any filter suitable to the application may be used, for example filter cartridges, bag filters, pleated filters, packed fiberglass filter etc. Desiccants may also be added to the filter chamber to remove water from the air before the air enters the blower or compressor. The filter chamber provides dampening thus assisting the silencer by reducing the sound emitted from the container. Baffles may be added to the silencer chamber to control airflow and reduce noise. Acoustic materials may also be added to the silencer chamber to reduce noise.

[0005] Insulation may be added to either chamber or the over all container to further control noise and temperature.

[0006] Air to air heat exchangers or air to liquid heat exchangers may be added to either chamber or to the overall container to control temperature and assist in noise control.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1—Represents a cut away side view of a combination air filter and silencer disposed within a single container. In this example cartridge filters are used as the filter and an un baffled cylinder is used as the silencer chamber. The refuge from the filters is shown settled on the bottom of the filter chamber. Harmonics created by the silencer vibrate refuge from the filters thus creating a self-cleaning filter system.

[0008] FIG. 2—is similar to FIG. 1 but with the added feature of a removable bottom clean out. A top view of the filter baffle is also shown.

[0009] FIG. 3—is similar to FIG. 1 but with the added feature of a baffle system disposed within the silencer chamber and a packed air filter media is used in lieu of a self-cleaning filter media.

[0010] FIG. 4—is similar to FIG. 3 except that a sound absorbing acoustic material is disposed within the silencer chamber and an insulation is placed on the combo container housing, also a bag filter is used on the filter chamber.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] Using the drawings, the preferred embodiments of the present invention will now be explained.

[0012] FIGS. 1, 2, 3, and 4 represents the embodiment of the invention in a variety of environments according to the preference of the user. The apparatus of the present invention includes a container 6 having a silencer chamber 3 disposed within container 6. Silencer 6 has an air inlet conduit 1 and an air outlet conduit 2. Container 6 also has a filter chamber 7 disposed within it. Filter chamber 7 may use any filter or dehydrator or choice including a cartridge filter 20, a bag filter 21, or a parched filter 19. Refuge 9 vibrated from the filter will settle in the bottom of chamber 7. A removable bottom clean out 10 provides access to clean the refuge 9 from container 7. Access lid 11 allows the filters 19, 20, and 21 and filter support plate 13 to be serviced. Fastener 12 holds access lid in place.

[0013] Filter chamber 7 has an air inlet conduit 4 and an air outlet conduit 5. A vibrator 22 may be added to assist in cleaning the filters. Filter support plate 13 has a plurality of orifices 14 to allow filters to be mounted and air to flow through.

[0014] Insulations 15 may be added to either of the chambers or the overall container. Baffles 16 may be disposed within the silencer to manage airflow and abate noise. Sound absorbing acoustic material 17 may be placed with the silencer chamber 3.

[0015] An air to air or air to liquid heat exchanger may be attached to either chamber 3 or 7 or to the overall container 6.

What is claimed

1. A container device having both, a silencer chamber and an air filter chamber disposed within it and inlet and outlet conduits to each chamber.
2. A container device according to claim 1 whereby the filter chamber has a filter media disposed within it capable of self-cleaning its self of filtered refuge when vibrated.
3. A container device as described in claim 1 or 2 whereby the filter media is vibrated by harmonics created by the silencer chamber.
4. A container device as described in claim 1 whereby the filter media is vibrated by a mechanical vibrator being a piston vibrator, a ball vibrator, or a rotary vibrator.
5. A container device as described in claim 1 where by a packed acoustic filter media is disposed within the filter chamber.
6. A container device as described in claim 1 whereby a dehydrator media is disposed within the filter chamber.
7. A container device according to claim 1 whereby two or more filter chambers are dispersed within the container.

8. A container device according to claim 1, 2, 3, 4, 5, 6, or 7 whereby the silencer chamber has a baffle system disposed within it.

9. A container device according to claim 1-8 whereby the silencer chamber has an acoustic material disposed within it.

10. A container device according to claims 1-9 whereby the container is constructed of an acoustic substance.

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