Aug. 26, 1969 S. ZALMAN 3,462,919

POLLUTANT TREATING AND ELIMINATING DEVICE

Filed May 29, 1967 3 Sheets-Sheet 1

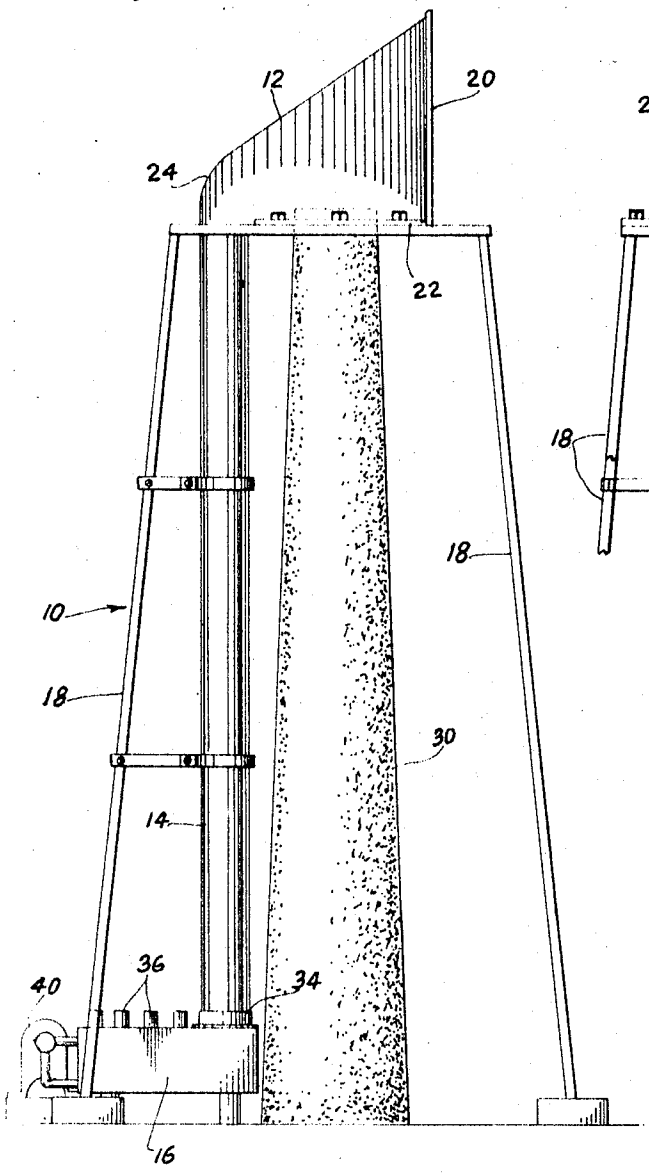


Fig. 1

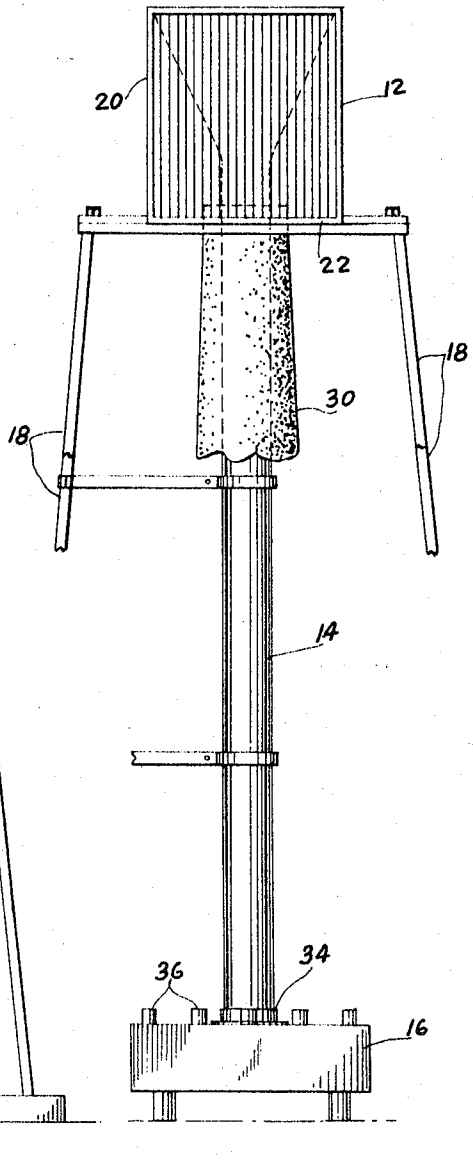


Fig. 2

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POLLUTANT TREATING AND ELIMINATING DEVICE

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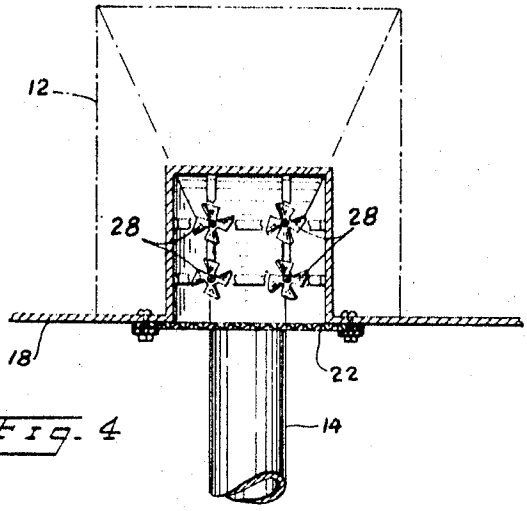


Fig. 4

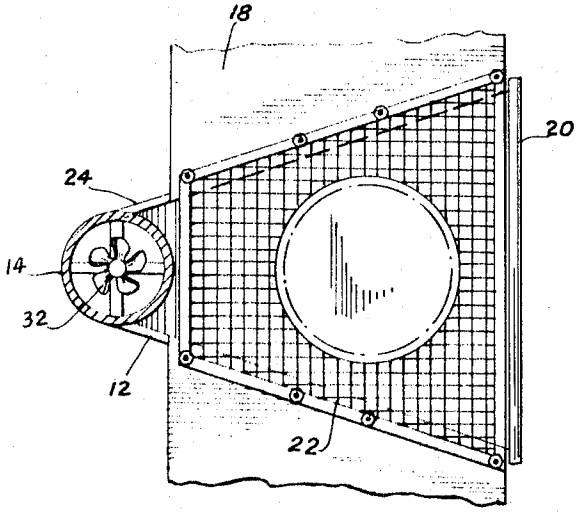
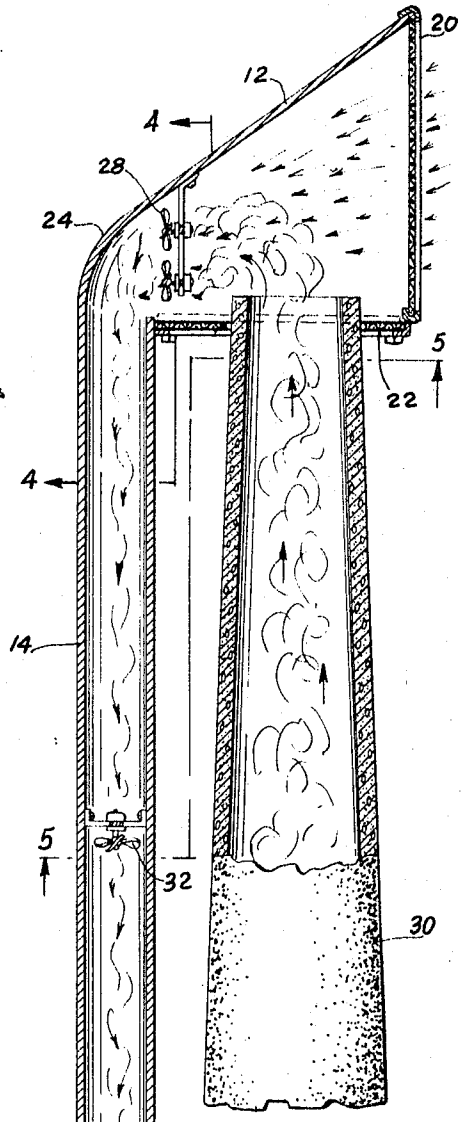


Fig. 5



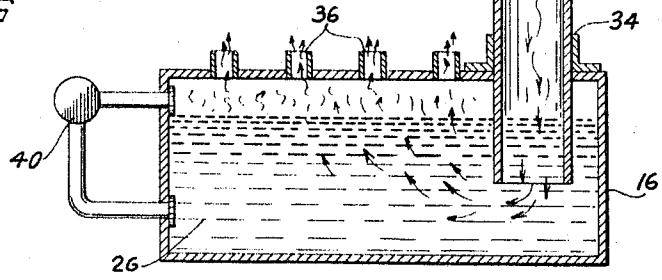


Fig. 3

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POLLUTANT TREATING AND ELIMINATING DEVICE

Filed May 29, 1967 3 Sheets-Sheet 3

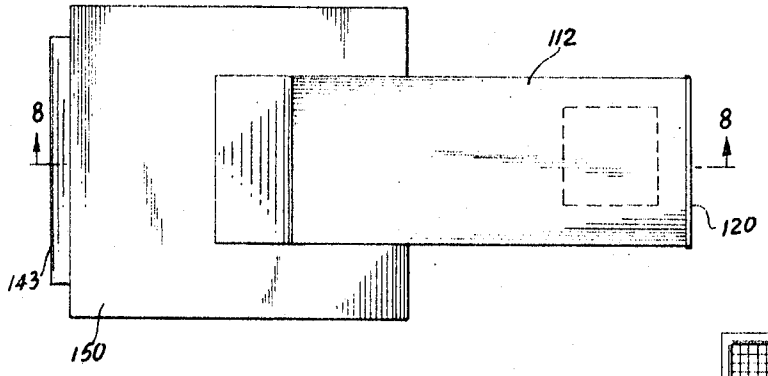


Fig. 6

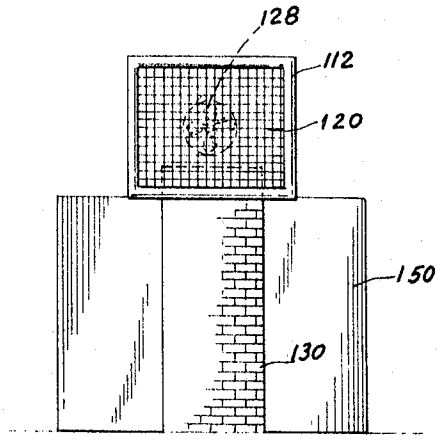


Fig. 7

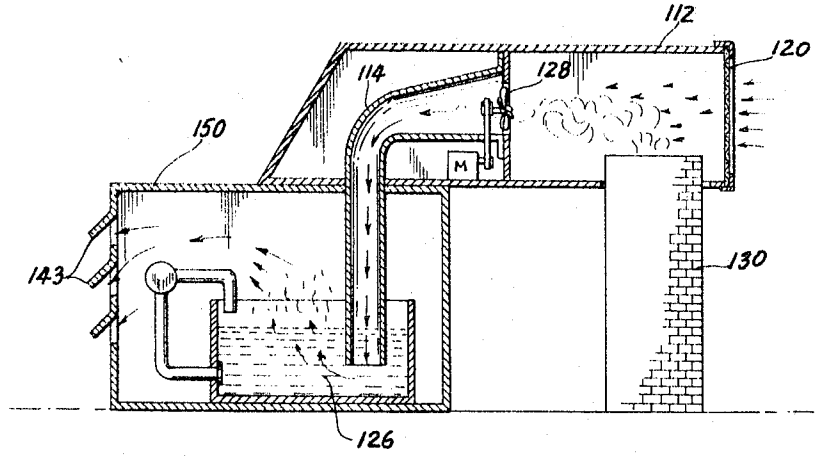


Fig. 8

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3,462,919

POLLUTANT TREATING AND ELIMINATING DEVICE

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U.S. Cl. 55—256 3 Claims

ABSTRACT OF THE DISCLOSURE

A pollutant treating and eliminating device for treating and eliminating pollutants from exhausts emitted into the atmosphere comprising a hood enclosing the exhaust outlet, a forced air stream drawn into the hood from the atmosphere mixing with the exhaust, the exhaust and atmosphere mixture being positively passed through a fluid, wherein the hood is open to the atmosphere to permit the exhaust to escape in the event of a failure of the forced draft.

BACKGROUND OF THE INVENTION

Field of the invention

Air pollution control devices for use in conjunction with exhausts which otherwise carry pollutants to the atmosphere.

SUMMARY OF THE INVENTION

It is perhaps unfortunately true that those densely populated and industrialized areas which produce the greatest amount of air pollution have for the protection of the inhabitants the strictest and most closely regulated zoning, building and construction ordinances which severely limit and restrict the design, erection and use of any and all mechanisms for the control of that pollution.

Accordingly it is an object of the present invention to provide an air pollutant treating and eliminating device adapted for use with pollutant carrying exhausts which is in strict accordance with those strictures of municipalities as relate to design, erection and use.

It is another object of the present invention to provide an air pollutant treating and eliminating device for pollutant carrying exhausts which will eliminate those pollutants in the most effective manner and yet in the safest.

It is a further object of the present invention to provide an air pollutant treating and eliminating device utilizing a forced draft system but which also provides fail-safe features in the event of a failure of that system.

It is a still further object of the present invention to provide an air pollutant treating and eliminating device for use in conjunction with existing exhaust outlets such as chimneys.

Basically, and not by way of limitation, the present invention comprises a hood which is placed over the outlet of a chimney. The hood is ducted to a liquid immersion treating tank. A forced draft system draws in air from the atmosphere through a frontal opening in the hood and through a bottom opening in the hood, mixes it with the pollutant laden exhaust and positively forces the air exhaust mixture through the liquid treating bath. The shape and construction of the hood is such that, in the event of a failure of the forced draft system, the exhaust is permitted free escape to the atmosphere.

BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 is a side view of the air pollutant treating and eliminating device of the present invention shown erected over a chimney.

FIGURE 2 is a front fragmentary view, partly in phantom, of the air pollutant treating and eliminating device of FIGURE 1.

FIGURE 3 is a partial side cross-sectional view of the air pollutant treating and eliminating device of FIGURE 1, showing a forced draft.

FIGURE 4 is a partial cross-sectional view as taken across line 4—4 of FIGURE 3 and showing the front of the hood in phantom.

FIGURE 5 is an enlarged fragmentary cross-sectional view as taken across line 505 of FIGURE 3 with the chimney removed therefrom.

FIGURE 6 is a top view of a modified embodiment of the air pollutant treating and eliminating device of the present invention.

FIGURE 7 is a front view of the modified embodiment of the present invention shown in FIGURE 6.

FIGURE 8 is a partial cross-sectional view taken across line 8—8 of FIGURE 6 showing the forced draft.

DESCRIPTION OF A PREFERRED EMBODIMENT

Referring to the drawing, the air pollutant treating and eliminating device **10** of the present invention comprises a hood **12**, a duct **14**, a liquid immersion treating tank **16** and a supporting framework **18**.

Hood **12** is tapered downwardly from front to rear. The front **20**, which may have a rectangular cross-section, is completely open and unencumbered except, perhaps, for an open mesh fowl excluding screen which is not intended to obstruct an air flow. The bottom **22** of hood **12** is also fully open to the atmosphere again except for the possible inclusion of an open mesh grill adapted to save the feathers of curious birds while not interfering with the air flow. The top and sides of hood **12** taper downwardly and inwardly from front **20** to rear portion **24** and connect to and communicate with downwardly extending duct **14**. Duct **14** extends into tank **16** and opens below the surface of the liquid **26** contained therein.

A forced positive draft is created by a plurality of fans **28** mounted within hood **12** adjacent rear portion **24** and forces air from front **20** and bottom **22** toward rear portion **24** and into duct **14**. A secondary fan **32** may be located within duct **14** for further aiding the forced draft and overcoming frictional resistance of the duct and of fluid **26**.

Tank **16** has an inlet **34** through which duct **14** extends and has an outlet system which may consist of a plurality of outlets **36** ducted to the atmosphere.

OPERATION OF A PREFERRED EMBODIMENT

Air pollutant treating and eliminating device **10** is erected about chimney **30** such that the top of the chimney extends through bottom **22** and partly into hood **12**. If a bird screen is provided across bottom **22**, it should of course have a central opening to permit the passage of chimney **30**. The opening should be slightly larger than the outside dimensions of the chimney so as to permit relative movement between chimney **30** and hood **12** as would occur from thermal changes, windload and the like. The opening of chimney **30** is located between front **20** and fans **28**.

With fans **28** and **32** operating air from the atmosphere is drawn into hood **12** from front **20** and bottom **22**. It is pulled toward rear portion **24** along with the exhaust of chimney **30**. No portion of the exhaust can escape hood **12**. The mixed exhaust and air is forced down duct **14** into fluid **26** through which it passes out to the atmosphere via outlets **36** but not before the pollutants contained in the exhaust are trapped, removed and contained by fluid **26**.

In the event of a failure of the forced draft created by fans **28** and **32**, the never ceasing exhaust flow up chimney **30** is then directed by the taper of hood **12**

through front **20** and out to the atmosphere in the normal unencumbered pollutant carrying manner.

Fluid **26** may be any such liquid as will trap and remove the pollutants in the exhaust. Water, perhaps mixed with an anti-freeze solution, may well be adequate for most purposes. A pump filtering and recirculating filter **40** may be provided to circulate fluid **26** and mechanically remove the pollutants trapped therein.

DESCRIPTION OF A MODIFIED EMBODIMENT

A modified embodiment of the present invention is shown in FIGURES 6–8. Chimney **130** extends into hood **112** between the front **120** thereof and fan **128**. Fan **128** draws air from the atmosphere in through open front **120**, mixes it with the exhaust of chimney **130**, and forces it through duct **114** into fluid **126** through which it is filtered and escapes to the atmosphere via louvers **143** in an enclosure **150**. A failure of fan **128** to pump the exhaust into fluid **126** is not fatal since the exhaust may readily escape to the atmosphere through open front **120** of hood **112**.

While the foregoing is illustrative of preferred and modified embodiments of the present invention it is clear that other embodiments and modifications may be had within the teachings of the invention and the scope of the claims. For example, a plurality of tanks **16** may be employed in rotation permitting a previously used tank to be cleaned while a previously cleaned tank is used. Alternatively a plurality of tanks **16** may be used in succession, one after the other with the air mixture of air and exhaust being pumped from one to the next so as to permit more positive and/or selective removal of the pollutants. Different fluids may be employed in the different tanks for this purpose. Again, alternatively, mechanical rather than fluid filtering system may be employed.

What is claimed is:

1. An air pollutant treating and eliminating apparatus for removing pollutants from chimney exhausts, from a chimney comprising;

an open hood extending horizontally, the top wall of said open hood tapering downwardly from front to rear and the sides of said open hood tapering inwardly from front to rear, the front of said open hood defining a front opening and the bottom of said open hood defining a bottom opening, an inlet in the bottom for receiving the chimney, said inlet being smaller than said bottom opening and spaced apart from the rear of said hood, both openings permitting free passage of air, said open hood being placed about the top of the chimney at said inlet so that it extends into said hood through a portion of said bottom opening;

a liquid filter tank positioned adjacent to the base of the chimney including a body of liquid and having at least one outlet above the upper surface of the liquid;

a vertical duct connecting the rear of said open hood at a rear wall thereof to the inlet of said liquid filter tank, said duct being disposed below the surface of said liquid at the tank inlet;

a support means for supporting said open hood and said duct; and,

air pump means including a plurality of fans disposed within said hood adjacent to its connection with said duct for drawing the air into the front and bottom openings of said open hood for mixing with the chimney exhaust and conducting the mixture through said duct into said liquid filter tank.

2. The apparatus as recited in claim **1** wherein said air pump means comprises a second fan disposed within said connecting duct for drawing said mixture into said fluid filter tank.

3. The apparatus as recited in claim **1** wherein said liquid filter tank additionally comprises a liquid pump and filter means for circulating the liquid in said tank.

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U.S. Cl. X.R.

55—261, 421, 468, 471; 98—115; 261—17, 77, 121