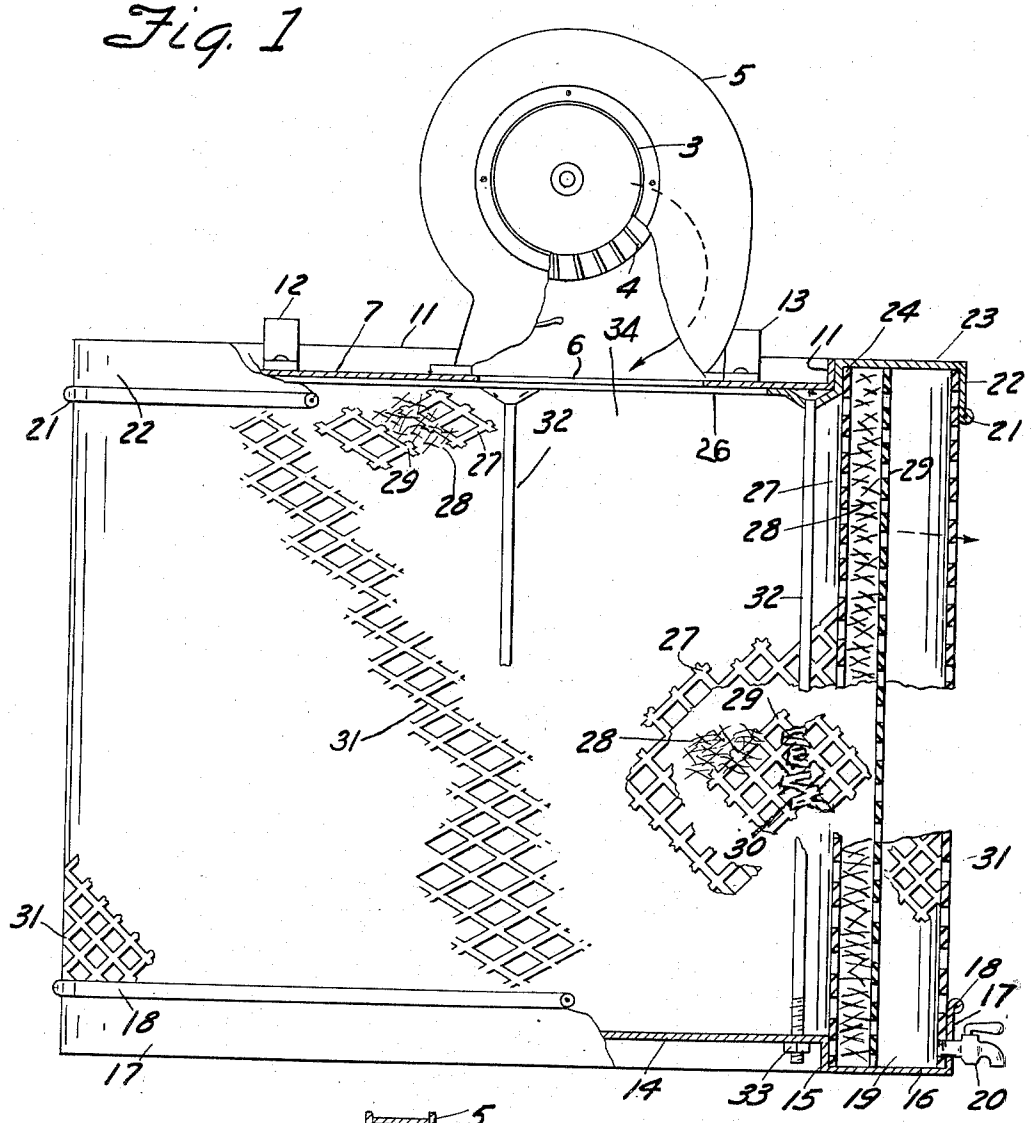
Oct. 3, 1950 H. L. GILMORE 2,524,347

FILTER UNIT

Filed Nov. 25, 1946 2 Sheets-Sheet 1

Fig. 1



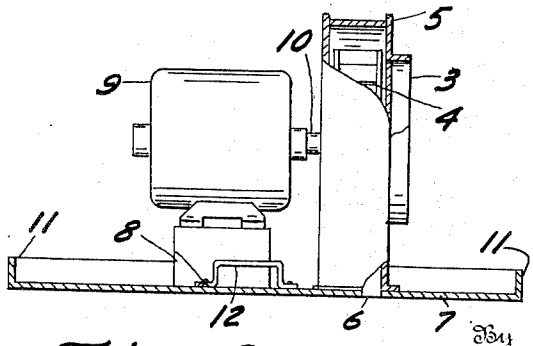


Fig. 2

Inventor

Harry L. Gilmore

By

Attorney

Oct. 3, 1950

H. L. GILMORE

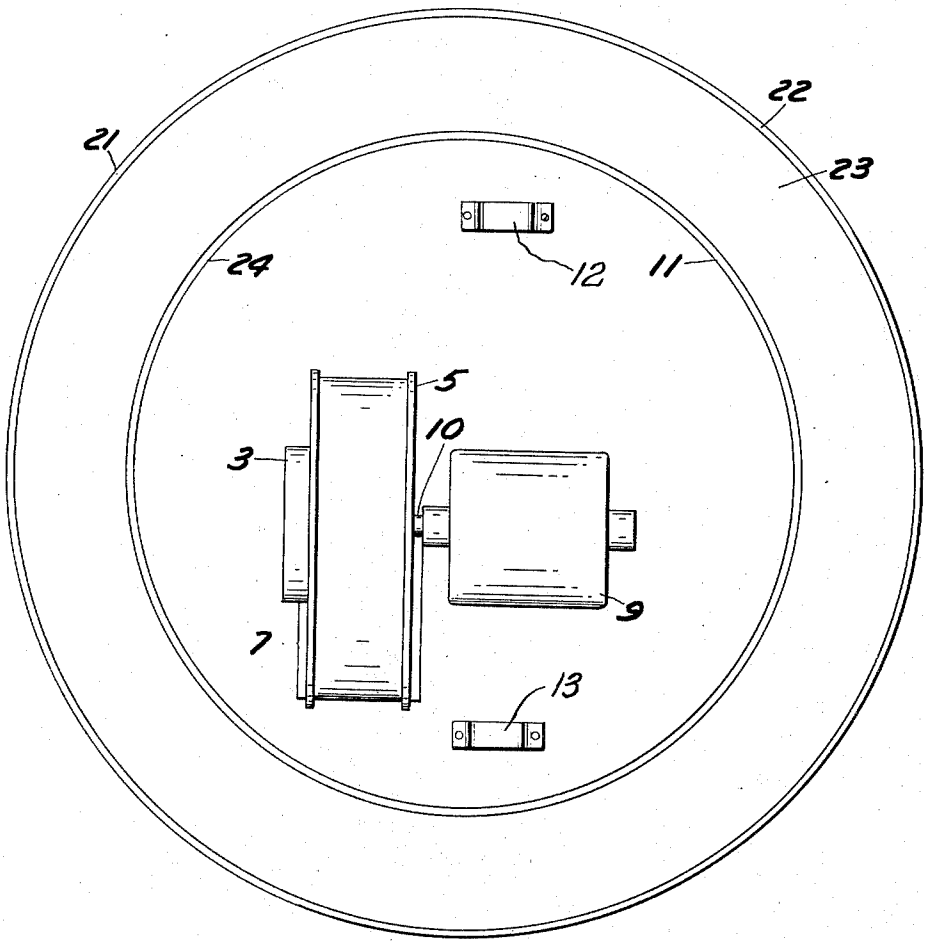
2,524,347

FILTER UNIT

Filed Nov. 25, 1946

2 Sheets-Sheet 2

FIG. 3



Harry L. Gilmore

Inventor

By Geo E. Kirk

Atty.

Patented Oct. 3, 1950

2,524,347

UNITED STATES PATENT OFFICE

2,524,347

FILTER UNIT

Harry L. Gilmore, Adrian, Mich., assignor to Aget Manufacturing Company, Adrian, Mich., a corporation of Michigan

Application November 25, 1946, Serial No. 712,058

1 Claim. (Cl. 183—36)

1

This invention relates to entraining and removing suspensions from gaseous medium.

This invention has utility when incorporated in air cleaners, purifiers, filters, screens and salvaging, collecting and separating means for substances, as excess humidity, fume contamination, volatiles and vapors. In many factory and production operations, atmosphere charges affect vision, respiration of employees or attendants, as well as develop hazard to interior upkeep and appearance. The general volume of air may be detrimental only as to odors, vapors, or particles in suspension. Besides respiratory value, especially for the ones occupying the room or building, the temperature thereof should be taken into account. Especially in extreme heat or extreme cold seasons, the conditioning of the air as to temperature involves considerable power consumption, much beyond that of operating the equipment herein disclosed, as per volume of air to be handled. Specifically, in many machine operations, cutting tools are flooded with oil or coolant. Some fine particles of metal may get into the air to be in suspension as a dust, but the temperature of the tool and work promotes volatilization and vaporization. Rising air, so laden, tends to coat the building interior and equipment therein, and detrimentally. A suction duct as take-off to a unit as herein disclosed eliminates this production problem.

Referring to the drawings:

Fig. 1 is a side elevation, with parts broken away, of an embodiment of the invention in a vapor collector;

Fig. 2 is a detail view of the motor and suction fan unit or blower of Fig. 1, and its mounting, from the left; and Fig. 3 is a plan view of the unit.

The motor-blower unit lid

Contaminated or vapor carrying air 1, as from a machine tool using coolant, is conducted thru a duct 2 to an inlet 3 to a suction chamber of a multiblade fan 4 of a blower in a housing 5 having a discharge outlet 6 in a base 7. On the base 7 is a sheet metal chair or bracket 8 providing a pedestal upon which is fixed a motor 9 having a shaft 10 directly connected to the fan 4. The base 7 has a peripheral upstanding bounding rim 11. In convenient location for lifting this base and motor-blower unit are handles 12, 13.

The collector chamber

A bottom has a central section 14 to an outward flange 15 from which there outwardly ex-

2

tends parallel to the central section 14, a ring 16 to an upwardly extending rim 17 terminating in a bead 18. The portions 15, 16, 17, form a channel, trough or chamber 19 from which condensate or liquid may be drawn thru a spigot or valve 20.

Complementary to the channel 15, 16, 17, is a downwardly open channel from an outer bead 21, a riser flange 22, an inwardly extending web portion 23 to a shorter downward flange 24, from which there is a narrow inwardly extending ring portion 25 parallel to the channel web 23. The ring 25 leaves an open top 26.

Foraminous or expanded metal cylinder 27 has thereabout a continuous or endless bat or blanket 28 of fibrous or filter material, such as fiber glass. The uniformly distributed or holding position for the blanket 28 is established and maintained by an enveloping strip or wrap 29 which also may be of expanded metal and have its binding assembly effected by interlacing bend back portions 30 in effecting the desired degree of compacting for the blanket fiber 28 into a cylindrical filter nesting just outside the flanges 15, 24, and extending to abut the webs 16, 23. In some instances it may be desirable to shield the screen or filter cylinder or drum from knocks or bendings. To this end a third foraminous section or expanded metal cylinder 31 is supplied and of diameter just to nest inside the flanges 17, 22.

Upon locating the filter drum 27, 28, 29 and the shield 31 in the opposing channels 15, 16, 17, and 22, 23, 24, bolts 32 thru the inward flange or rim 25 and directly down to the bottom 14 adjacent to the inner wall 27, have nuts 33 thereon. The bolts 32 with the nuts 33 thereon thus provide assembly means for the drum filter structure. Accordingly, the screens may be locked in the assembly in forming an open top expansion or eddy receiving chamber 34.

The base 7 is a closure for the chamber 34. The rim 11 slides snugly in concentric seating relation with the flange 24 as the base 7 rests peripherally on the rim or flange 25. This places the motor-blower unit on top of the filter body with the blower discharge outlet 6 as the foul air entrance to the chamber 34.

Some of the factors of performance have been upon the basis of 614 cubic feet per minute of air to enter the throat or intake 3 as of 5'' diameter. With the filter drum region defined by the inside screen wall 27 of approximately 8 sq. ft. area, and the fan developing as much as 1½'' water in measuring the pressure drop, the back pressure in the chamber 34 has been in the range

of .2'' water above atmosphere. The fine fiber glass **28** has been brought to a body weight of about 6# per cu. ft. The pressure of 1½'' water above atmospheric pressure is developed thru a ⅓ H. P. motor operating at 3450 R. P. M.

When different vapors are in the liquid state, and they are of different specific gravities, separation thereof may be had by regulating the drawings off thru the valve **20**. Precipitation of particles of dust may be removed from the chamber bottom **14**, by lifting the lid unit clear of the opening **26**. With the motor **9**, running, water doused thru the inlet **3** is converted into a spray and efficiently washes down the solids, oils, or entrained matter from the filter. Uniform outward gas passage is had thruout the entire filter area at all times.

What is claimed and it is desired to secure by Letters Patent is:

A drum filter structure comprising a centrally upwardly offset imperforate bottom bounded by an endless upwardly open trough, a top complementary to the trough having an endless downwardly open groove opposing the trough, a removable closure for the top inward from the groove, said closure providing a central port and a lateral region therefrom, a fan motor mounted on the lateral region, a fan directly connected to the motor and mounted on the lateral region to exhaust thru the port, three spaced perforate cylinders between the trough and groove, a filter body spacing the inner two of said cylinders, assembly means between the top and bottom clamping the cylinders assembled in said structure, and a draw-off for condensation from the trough, said closure being removable with the fan and motor from the top, thereby to expose the upwardly offset bottom for removal of precipitation accumulation therefrom.

HARRY L. GILMORE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,319,565	Stratton	May 18, 1943
2,362,933	Schaefer	Nov. 14, 1944
2,390,297	Gilmore	Dec. 4, 1945
2,391,558	Essick	Dec. 25, 1945