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J. M. MORRISON

3,170,621

APPARATUS FOR EXHAUSTING FUMES FROM FACTORIES AND THE LIKE

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2 Sheets-Sheet 1

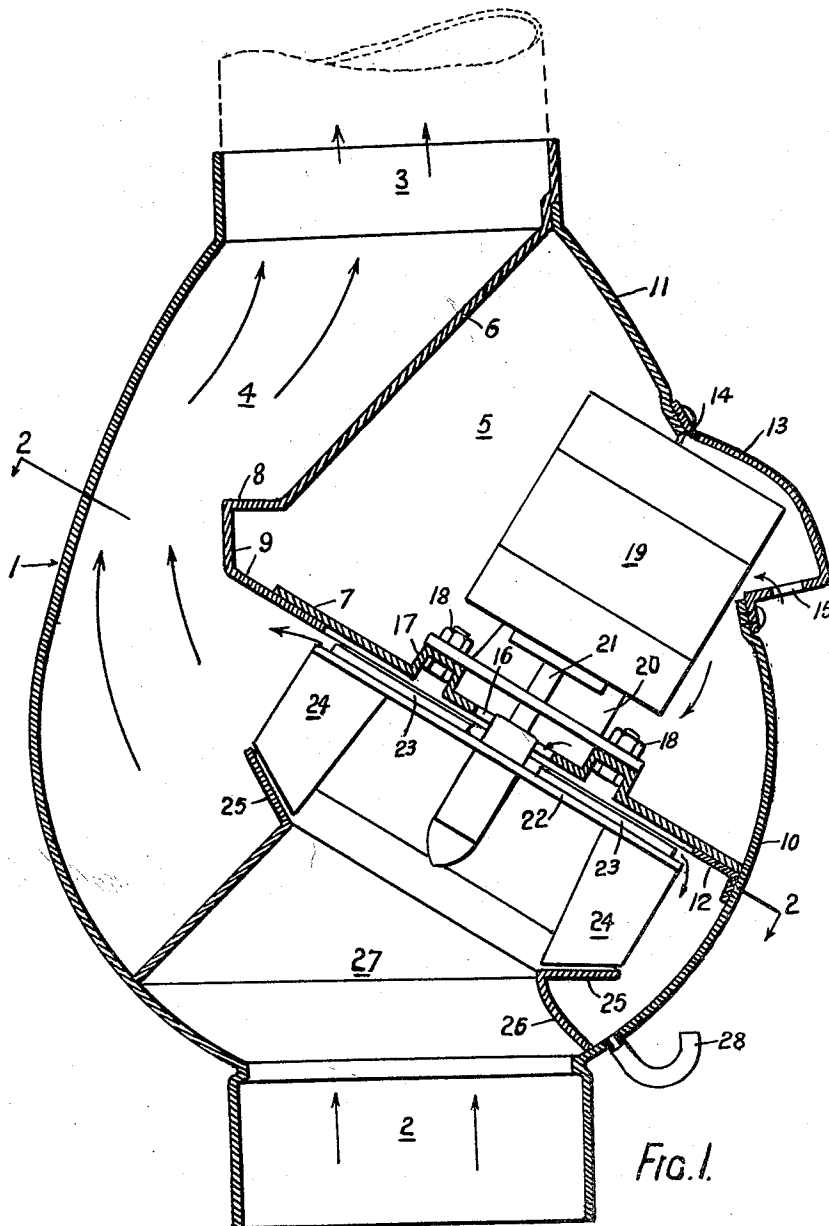


FIG. 1.

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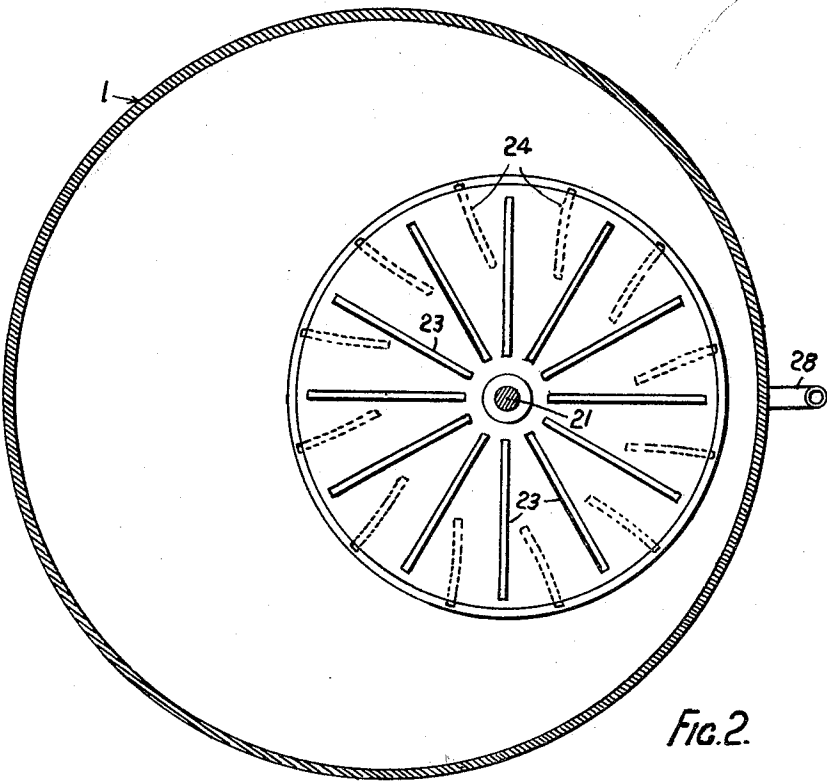
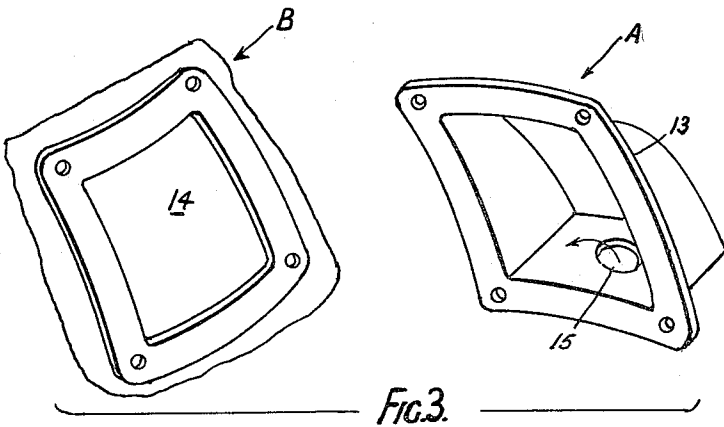
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APPARATUS FOR EXHAUSTING FUMES FROM FACTORIES AND THE LIKE

John Maynard Morrison, Carss Park, near Sydney, New South Wales, Australia, assignor to Centriflo Pty. Limited, Brighton-le-Sands, New South Wales, Australia, a company of New South Wales

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5 Claims. (Cl. 230-117)

This invention has been devised to provide an apparatus for exhausting fumes such as gas or vapour or air charged with poisonous or irritating substances from factories, laboratories, paint spraying booths and the like.

The apparatus comprises a casing having an inlet and an outlet in axial alignment. A motor driven fan wheel is mounted in the casing. The fan wheel has an axial intake and a peripheral discharge. A chamber in the casing houses and shields the motor from fumes passing through the casing.

One advantage resulting from the invention is that the high pressure and high volume characteristics of a centrifugal fan wheel are utilised in an axial flow line.

One embodiment of the invention is now described with reference to the annexed drawings, wherein:

FIGURE 1 is a longitudinal central sectional elevation of the apparatus;

FIGURE 2 is a section on line 2-2 of FIGURE 1;

FIGURE 3 is a perspective view in two parts A and B, part A being an inspection cover and part B being the part of the casing on which the inspection cover is mounted.

In this embodiment the casing 1 is of a substantially pear shape having a tubular projection 2 at the bottom and a like projection 3 at the top in axial alignment one with the other and constructed for connecting into an exhaust duct. The "tube" 2 is the inlet to the casing and the "tube" 3 is the outlet from the casing.

The casing 1 is divided into two chambers 4 and 5 by a side plate 6 and a bottom (base) plate 7. The side plate 6 extends from one side of the casing adjacent the outlet 3 obliquely downwardly towards the other side of the casing. Near the bottom it is shaped to form a drip deflector as indicated at 8 and below this it is flanged as indicated at 9 to provide one part of a support for the base plate 7.

The part of the casing 1 which forms a wall of the chamber 5 is made in two parts 10-11. The part 10 of the wall incorporates an internal flange 12 which with the flanged part 9 is shaped to constitute a circular opening slightly greater in diameter than the diameter of the fan wheel to be housed in the casing. The part 11 of the wall is removable to permit installation and removal of the fan motor. An inspection cover 13 is secured over an opening 14 in this part 11 of the wall. The inspection cover is curved outwardly from the top and the bottom is flanged inwardly. There is an air inlet port 15 through the flange.

The base plate 7 is mounted on the flanges 9 and 12. It has a hole 16 through which the shaft of the fan motor can pass and this hole also constitutes an air port. Concentrically with the hole 16 an inverted channel 17 is formed in the base plate 7 and holes are formed in the web of the channel to take fan motor holding bolts 18. The fan motor 19 is mounted on an end base 20 which

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is fixed to the base plate 7 by the bolts 18. The fan motor shaft 21 projects through the hole 16. A fan wheel 22 of the kind described in our Australian Patent No. 216,875 is mounted on the motor shaft 21. This fan wheel has supplementary radial vanes 23 on the back plate. These vanes arranged to draw air from "motor" chamber 5 through the air inlet port 15 and the port 16 around the motor shaft. This air is discharged into the air stream created by the main vanes 24 of the fan wheel 22. The circulation so created maintains a cooling draft about the motor and prevents fumes entering the motor chamber. It eliminates the use of a gland seal on the motor shaft.

A shroud 25 for the ends of the main vanes 24 of the fan wheel 22 made in the form of an annular (angled) plate has the central edge extended and shaped as at 26 for fixing to the wall of the casing 1; it constitutes an inlet duct 27 to the fan wheel from the tube 2. A water sealed drain pipe 28 is connected into the low part of the casing 1.

I claim:

1. Apparatus for exhausting fumes, comprising:

(A) a casing having an inlet and outlet in axial alignment;

(B) a motor mounting chamber enclosed within said casing, said chamber being defined by:

(1) a first portion of the wall of said casing disposed between said inlet and outlet;

(2) a first partition joined to said first portion and extending downwardly therefrom obliquely across the interior of said casing to a deflecting end terminating short of a second portion of the wall of said casing opposite said first portion to define with said second portion a passageway open to said outlet; and,

(3) a second partition joined to the deflecting end of said first portion and extending downwardly therefrom obliquely across the interior of said casing to a juncture with said first portion of the casing wall, said second partition having an opening therein to accommodate the passage of a motor shaft therethrough;

(C) a motor mounted in said chamber so as to have the driven shaft thereof extending through said opening;

(D) a centrifugal fan wheel mounted on said shaft; and,

(E) shrouding means supported on said casing to direct fluid medium from the inlet thereof to the intake of said fan wheel and from the exhaust of said fan wheel to said passageway.

2. An apparatus according to claim 1 wherein said motor is mounted in said chamber on means supported on said second partition.

3. An apparatus according to claim 1 wherein:

(A) said first portion of the wall has an opening therethrough for the entrance of air into said chamber;

(B) said opening in said second partition is so dimensioned and disposed as to permit air to be exhausted therethrough from said chamber; and,

(C) said fan wheel includes vanes arranged to draw air from the chamber through the opening in said second partition.

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4. An apparatus according to claim 3 wherein the opening in said first portion of the wall is so dimensioned and disposed as to permit access to said motor and including a removable cover extending over said opening, said cover having an air port therethrough.

5. An apparatus according to claim 1 including a drain opening in the lower end of said casing and wherein:

(A) said first partition is adapted to deflect any water entering the outlet of said casing onto said shrouding means; and,

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(B) said shrouding means is adapted to direct water deflected thereonto through said drain opening.

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10 ROBERT M. WALKER, *Primary Examiner.*