Jan. 8, 1963 L. G. TRIPLETT 3,072,040

DIP TANK FOR TOXIC FLUIDS

Filed Dec. 20, 1960

Fig-1

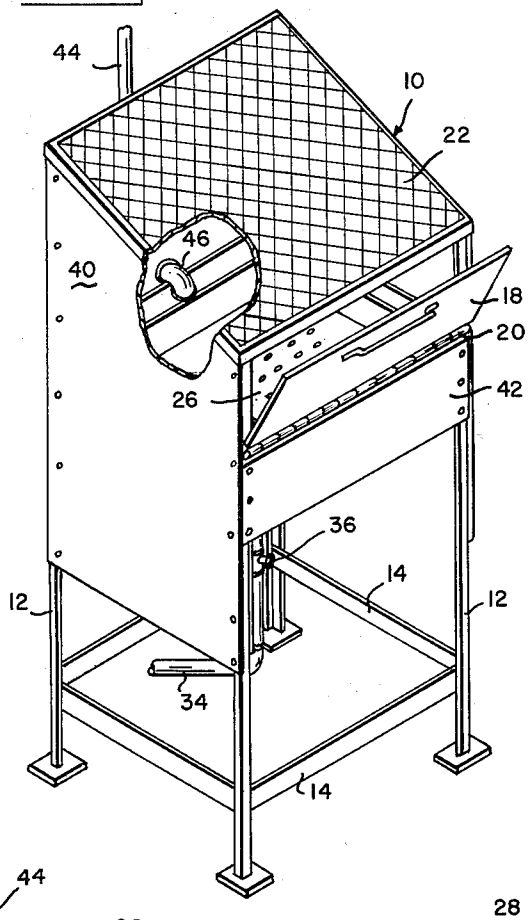
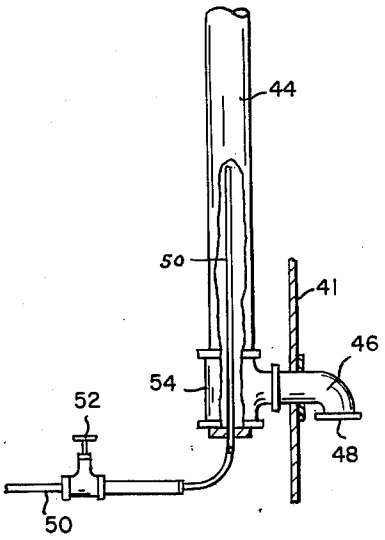


Fig-2



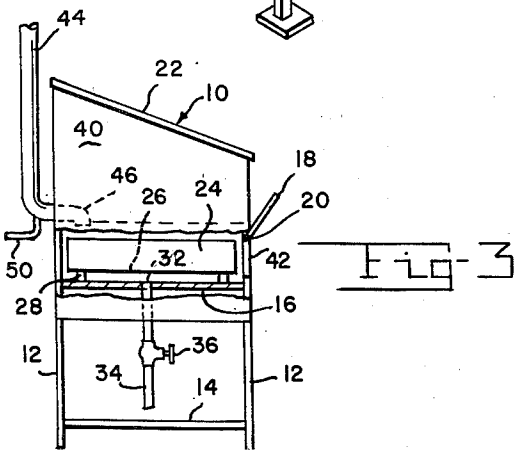


Fig-3

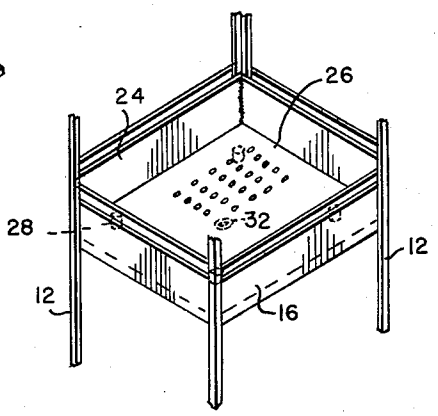


Fig-4

INVENTOR.
LEON G. TRIPLETT
BY Wade Kooney
Ruth Codlin Jones
ATTORNEYS

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DIP TANK FOR TOXIC FLUIDS

Leon G. Triplett, Rosamond, Calif., assignor to the United States of America as represented by the Secretary of the Air Force

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(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the United States Government for governmental purposes without payment to me of any royalty thereon.

This invention relates to a device for removal of gases from tanks where toxic fluids are used for cleaning or other uses and, more particularly, to a device for removing fumes from a tank wherein toxic liquids are used for degreasing and cleaning of machine parts and like articles.

As is well known, the problem of safety to workers around tanks and other apparatus where toxic fluids are used is an acute problem. Apparatus now in use for this purpose is elaborate and costly. Vacuum apparatus requires electric motors, force feed systems and elaborate and costly ducting.

The object of the present invention is the provision of a closed cabinet for holding volatile toxic cleaning fluid, for example, degreasing apparatus for machine parts by hand dipping.

A further object of the invention is the provision of a device wherein maximum safety for personnel, maximum efficiency and ease of operation, and minimum cost are achieved.

A further object of the invention is the provision of a device wherein a source of compressed air, for example, a shop air line is used for creating a vacuum for removing of fumes.

A further object of the invention is the provision of a cleaning unit raised to a convenient working height where visibility is provided.

In the drawing, FIG. 1 is a perspective view of the device.

FIG. 2 is a detail with portions broken away, of the vent duct from the tank and its connection with the shop air line.

FIG. 3 is a side view of the cabinet with portions broken away showing the device installed.

FIG. 4 is a fragmentary view of a portion of the frame and tank with the top and sides removed.

Referring more in detail to the drawing, a cabinet frame is indicated generally by the numeral 10. It comprises angle iron legs 12 braced by suitable brace element 14. An open topped main tank 16 of material suitable for containing toxic cleaning fluids is welded or otherwise suitably attached to the inner facing surfaces of the angle iron 12 and placed at an expedient working height.

A door 18 located on the front of the cabinet is hinged by means of a horizontal hinge 20 substantially at the level of the top of the tank 16 for convenient access and for placement of material to be cleaned. The upper wall or top cover portion of the cabinet is placed at an angle, for example, an angle depressed 65° from the horizontal, and is made of transparent noncorrodable material, preferably reinforced glass, so that there is complete visibility of the contents of the tank and complete protection of the operator from toxic fumes rising therefrom. The cover or top portion may be permanently secured or be removable, as desired.

A tray or inner receiving tank 24 is positioned within the tank 16 and is provided with a perforated floor 26, which is raised and spaced from the bottom of the tank 16 by means of legs 28. The legs 28 may be permanently attached by welding or other suitable means or the tray

24 may be removable as desired. The floor of the tank 16 is provided with a central drain opening 32, and an attached drain pipe 34 and controlling valve 36. The tank material may be made of any suitable material which is impervious to the toxic liquid to be contained therein. The joints and seams are made airtight. Shielding wall sections are attached to sides, back and front as shown at 40, 41 and 42.

A vertical flue or vent pipe 44 has a horizontal section, which is brought through the rear wall of the tank, and an elbow 46 bent at an approximate 90° angle so that it presents an open mouth 48 a few inches above the level of liquid in the tank. A pipe 50 is connected to the shop air line (not shown) and led through a control valve 52, through a suitable fitting 54 and into the vent pipe 44 at a point slightly below the level of the mouth 48, and upwardly a distance, for example 30 inches into the vent pipe 44. Aluminum tubing because of its lightweight and noncorrosive quality have been successfully used for this purpose. Aspirator action thus augments the upward draft in the flue 44, causing suction and consequent vacuum in the cabinet space above the work tank, and the removal of fumes therefrom.

It will now be apparent that the device offers a maximum of safety to the worker. The toxic fumes are drawn off efficiently and vented without the necessity of complicated and expensive installations.

While the invention is shown and described in connection with one form for illustrative, rather than restrictive purposes, it is obvious that changes and modifications may be made by those skilled in the art without departing from the scope and spirit of the invention as defined in the accompanying claims.

I claim:

1. A safety cabinet for degreasing articles where toxic fluid is employed as a cleaning agent, said cabinet comprising a back wall, a front wall, side walls and a top wall, a frame for supporting said walls, said top wall comprising non-corrosive transparent material and formed to slope downwardly from rear to front, a main tank located within said cabinet and supported by said frame in such manner as to provide a closed space within said cabinet above said tank, a horizontally hinged door on said front wall for insertion and removal of articles to be cleaned, a floor in said main tank, said floor being provided with an outlet opening, means providing a closable drain secured in said opening, a receiving tray positioned within said main tank, a perforated floor in said tray spaced from the floor of said main tank, an aspirator tube entering said cabinet through a rear wall thereof, said tube being provided with a mouth opening directed downwardly and located above said main tank to receive fumes emanating from said tank, a vertical section on said aspirator tube located rearwardly and outside of said tank, a pipe connected to an air pressure source, said pipe entering said tube at a point outside said main tank, said pipe extending upwardly within said tube a distance equaling a portion only of the height thereof thereby providing aspirator action for withdrawing toxic fumes from said main tank upwardly through said tube.

2. A safety cabinet for degreasing articles where toxic fluid is employed as a cleaning agent, said cabinet comprising a frame, an open topped tank having a base and side walls, said tank being secured to said frame, said base being provided with a drain orifice, valve means connected with said orifice for controlling fluid flow therethrough, a perforated tray smaller than and having the same configuration as said tank, means secured to said tray for mounting said tray within and spaced from said tank, a series of side walls secured to said frame extending above and encompassing said tank, an inclined top secured to said side walls to produce an enclosed space above

said tank, a horizontally hinged door located in one of said encompassing side walls above the level of said tank for insertion and removal of articles to be degreased, an aspirator tube through another of said encompassing side walls above said tank, a downwardly directed portion at the end of said tube within said enclosure to receive fumes emanating from said tank, a vertical section on said aspirator tube located rearwardly and outside of said safety cabinet, a pipe connected to an air pressure source, said pipe entering said vertical section at a point outside said cabinet, and extending upwardly within said section a distance equaling a portion only of the height thereof thereby providing aspirator action for withdrawing toxic fumes from the enclosed space above said main tank upwardly through said tube.

References Cited in the file of this patent

UNITED STATES PATENTS

234,879	Macurdy	Nov. 30, 1880
403,261	Funck	May 14, 1889
1,405,053	McAdams et al.	Jan. 31, 1922
1,483,229	Maclachlan	Feb. 12, 1924
2,219,028	Wolff	Oct. 22, 1940

FOREIGN PATENTS

211,042	Great Britain	Feb. 14, 1924
762,121	Great Britain	Nov. 21, 1956