April 9, 1968 L. O. FREY 3,376,583

SINK CONSTRUCTION

Filed May 24, 1965 2 Sheets-Sheet 1

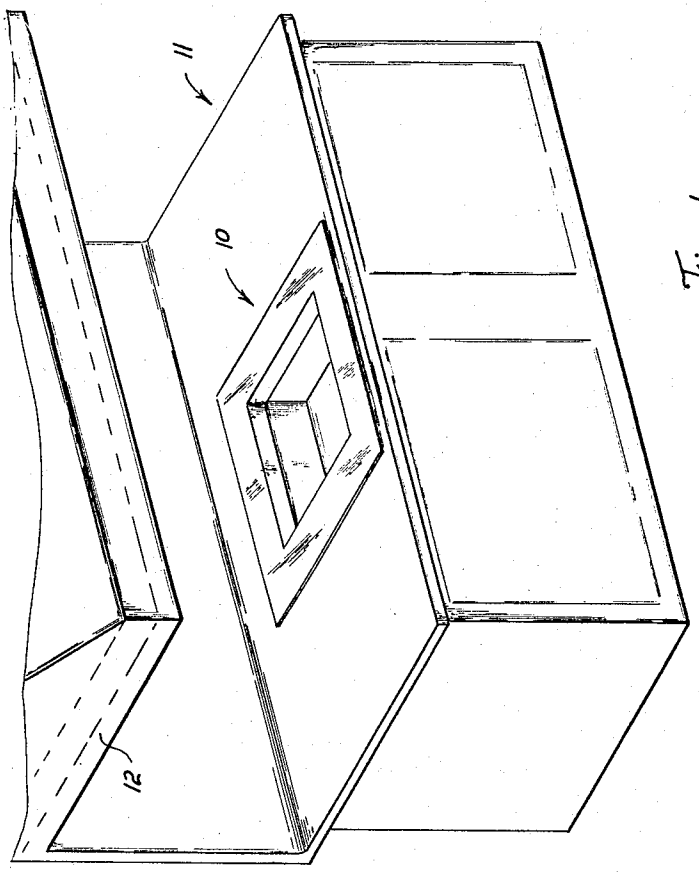

Fig. 1

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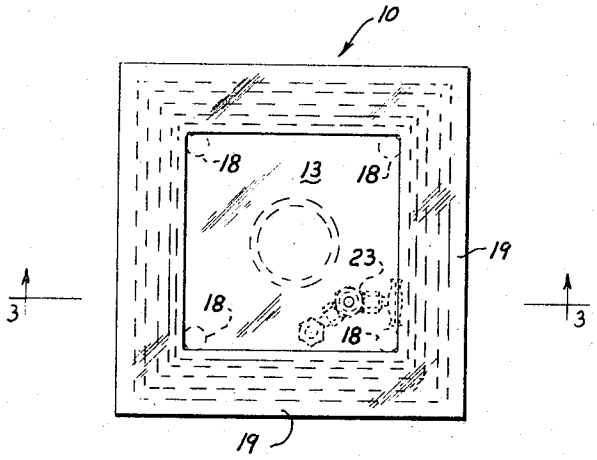

Fig. 2

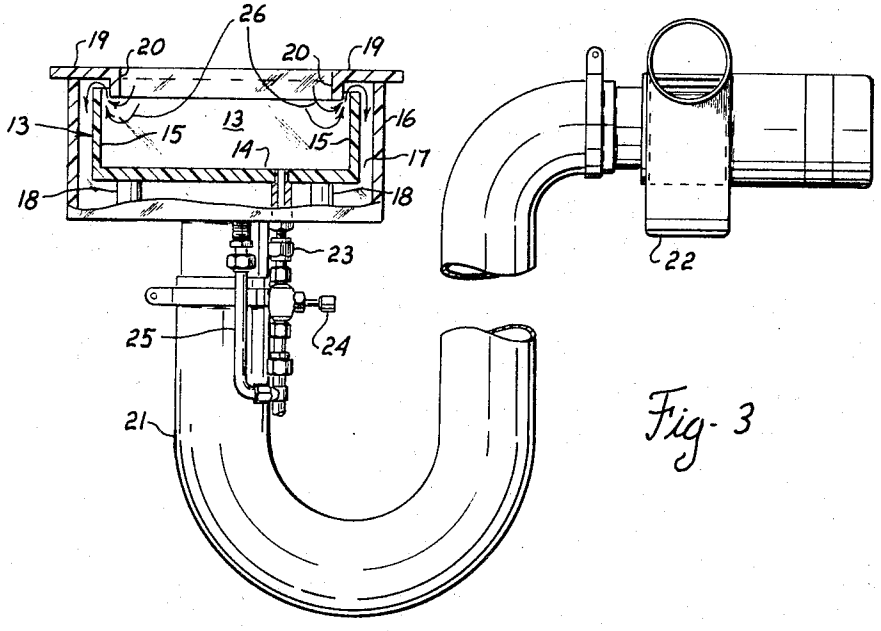

Fig. 3

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SINK CONSTRUCTION

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3 Claims. (Cl. 4—187)

ABSTRACT OF THE DISCLOSURE

Sink for handling chemical baths. Fume control means including a downwardly directed opening which leads from the sink to a chamber which in turn is connected to an exhaust system. Vapor condenses in the chamber and is collected and drained out through a drain valve.

This invention relates to improvements in sink construction and more particularly to a sink used for chemical solutions of the type which tend to give off noxious or irritating fumes.

While not limited thereto, sinks formed in accordance with this invention are particularly useful for chemical baths of the type used to remove scale, flakes, or other surface impurities from metallic elements, and also for various etching, plating or coating baths for metal parts.

In the past the noxious fumes given off by such baths have had to be drawn off from the surface of the bath by means of large exhaust hoods placed over the table on which the sink is located. The hoods draw a large volume of air upwardly out of the surrounding area, along with the fumes from the bath.

A chief drawback of this arrangement lies in this drawing off of a large volume of air from the area surrounding the bath. This creates quite troublesome problems in areas in modern plants where it is desirable to control temperature, humidity and other atmospheric conditions. The hood-type exhaust system may seriously overload equipment used for such purposes and at best makes atmosphere control a much more difficult and expensive task. Moreover, since the fumes are drawn upwardly, workmen leaning over the bath may accidently inhale them. This often leads to sickness and may in time prove fatal with some of the more toxic baths.

With the foregoing in view, a primary object of the present invention is the provision of a form of sink construction having means for drawing off noxious vapors from a sink, in a manner which offers little or no interference with the building air control system.

Another object of the invention is the provision of a sink having means drawing off noxious fumes, in which the entire unit is adapted for counter top installation.

A still further object of the invention is the provision of an extremely efficient form of chemical bath apparatus which protects workmen and attendants from the toxic vapors which arise from such baths.

Yet another object of the invention is the provision of a simplified form of exhaust system for a chemical bath which is extremely dependable and economical to manufacture.

The foregoing and various other objects of the invention are achieved by a sink which includes a basin for receiving the chemical solution, the basin being surrounded by a shell which is spaced therefrom to form a substantially enclosed chamber. A relatively narrow opening around the top edge of the basin leads to the enclosed chamber. A conduit extends from the chamber to an exhaust fan which draws vapors through the opening into the chamber and finally to atmosphere at a remote point, usually outside of the building in which the sink is located.

How these objects are achieved will become clearly

apparent upon reference to the following detailed description when taken in light of the accompanying drawings of an illustrative embodiment of the invention, in which:

FIGURE 1 shows a typical counter provided with a sink constructed according to the present invention;

FIGURE 2 is a plan view of a sink formed according to the invention; and

FIGURE 3 is a view, partly in section, of an elevational view of the sink of FIGURE 2, the section being taken along section line 3—3 of FIGURE 2.

Referring now in more detail to the drawings, in FIGURE 1 a sink **10** formed in accordance with the principles of the invention, is shown mounted in the top of a counter **11**. A hood **12**, housing conventional atmospheric control equipment, not shown, may be mounted over the counter **11** in order to regulate air conditions around the sink **10**.

Referring now to FIGURES 2 and 3, the sink comprises a basin **13** having a bottom wall **14** and peripheral side walls **15**, the basin being adapted to hold a chemical bath. The basin **13** is formed of a material which is resistant to attack by the particular solutions comprising the bath. For instance, a typical basin material would be a propylene plastic due to its resistance to attack by most acid baths. Other typical materials would be acrylic plastic or stainless steel, the latter being particularly useful for trichloroethylene or similar hydrocarbon baths. In the illustrative form of the invention, the basin is formed of polymethyl methacrylate sheet, this material being stable in the presence of moderate concentrations of most acids and bases.

Basin **13** is surrounded by a shell **16**. The shell is spaced from the basin slightly in order to provide a substantially closed chamber **17** around the outside of the basin walls. Supporting posts **18** position and support the basin within the chamber. The shell is generally made of the same material as the basin.

A laterally extending flange **19** is secured to the top of the shell. The outer, overhanging portion of flange **19**, provides a means for flush mounting the sink in a countertop. This edge may be beveled slightly, or the flange may be seated in a shallow recess if desired. The inner portion extends laterally inwardly over the top of the basin side walls and is provided with a downwardly extending lip **20**. The lip **20** terminates somewhat below the upper edge of the basin side walls **15**.

The lip and the basin side walls are spaced apart to form a relatively narrow opening from the basin **13** into the chamber **17**. The purposes of this opening will be explained more fully hereinafter.

A relative large duct or conduit **21** is connected to the chamber **17**, preferably substantially at the center of the bottom of the shell **16**. Conduit **21** leads to an exhaust fan **22**, typically of the centrifugal type. The fan conveys the fumes through further ducting, from whence it is conveyed to a point outside of the building which houses the sink structure.

A drain **23** is connected to the bottom of the basin **13** and extends downwardly through the shell **16**. The drain is preferably provided with a manually operable valve **24**. A bypass line **25** is connected to the shell **16** and joins the drain **23** at a point downstream from the valve **24**.

In operation, the fan **22** is turned on and the sink is filled with the selected chemical solution. The fan creates a relatively high velocity, low pressure stream of air through the opening formed by the lip **20** and the basin side walls **15**. Due to the size and form of this opening, the air drawn in follows a tortuous path in order to reach the chamber **17**, and the result is that the air flows down and sweeps over the surface of the basin **13** as is

indicated by the arrows **26** before it is drawn upwardly through the opening to the chamber. The relatively small opening contributes to the drawing effect by creating a high velocity, low pressure condition at the point of entry to the chamber. Substantially all fumes are drawn out through this opening into the chamber and through the conduit **21** to atmosphere.

In the event any of the solution splashes into the chamber **17**, the auxiliary drain **25** provides a line through which this can pass to the main drain **23**, even though the valve **24** is closed. Drain **23** typically leads to a suitable container housed beneath the counter **11**. At the end of treatment operation, the basin may be drained by opening the valve **24**.

The invention provides an extremely efficient means of removing the toxic vapors from acids or other noxious chemical solutions. In use, it has been found that practically none of the vapors escape to atmosphere. The invention is extremely simple, is well adapted to be mounted flush in the top of a counter and eliminates the need for cumbersome exhaust hoods. Its use avoids many of the problems of atmosphere control which are caused by such hoods.

I claim:

1. In a sink for handling chemical baths, the combination of a basin having a bottom wall and a peripheral sidewall; a shell surrounding said basin and spaced therefrom to form a substantially enclosed chamber; a narrow opening extending around the peripheral sidewall of the basin near the top thereof connecting the basin with the chamber, said opening facing downwardly within the confines of the basin and facing toward the bottom thereof and further being relatively small with respect to the volumes of the chamber and the basin; and an exhaust fan and a conduit connected to said chamber and associated with said fan for drawing off vapors from said chamber.

2. Apparatus according to claim **1**, further including a drain for said basin extending downwardly through said shell, a valve in said drain;

an auxiliary drain for said shell, said auxiliary drain being connected to said basin drain at a point downstream from said valve.

3. In a sink structure, the combination of a basin having a bottom wall and peripheral sidewall for holding a chemical bath; an outer shell surrounding said basin and spaced therefrom thereby forming a substantially enclosed chamber; exhaust means connected to said chamber for creating an air flow from said basin through said chamber to draw off vapors arising from the chemical bath in the basin; a flange on said outer shell spaced above and extending over said peripheral sidewall, said flange having a lip extending downwardly into the basin, said lip terminating below the top of the peripheral wall of the basin thereby creating a downwardly facing opening whereby the air drawn from the basin into the chamber follows a tortuous path, the opening from the basin into the chamber being the area of smallest cross section of the flow path.

References Cited

UNITED STATES PATENTS

1,173,520	2/1916	Hunter	4—217
1,213,113	1/1917	Lange	4—217
1,896,951	2/1933	Hahn	98—115
1,955,579	4/1934	De Malaussene	4—213
2,126,131	8/1938	Orebaugh	4—213
2,539,464	1/1951	Norquist	4—187

FOREIGN PATENTS

1,213,132	10/1952	France.

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