

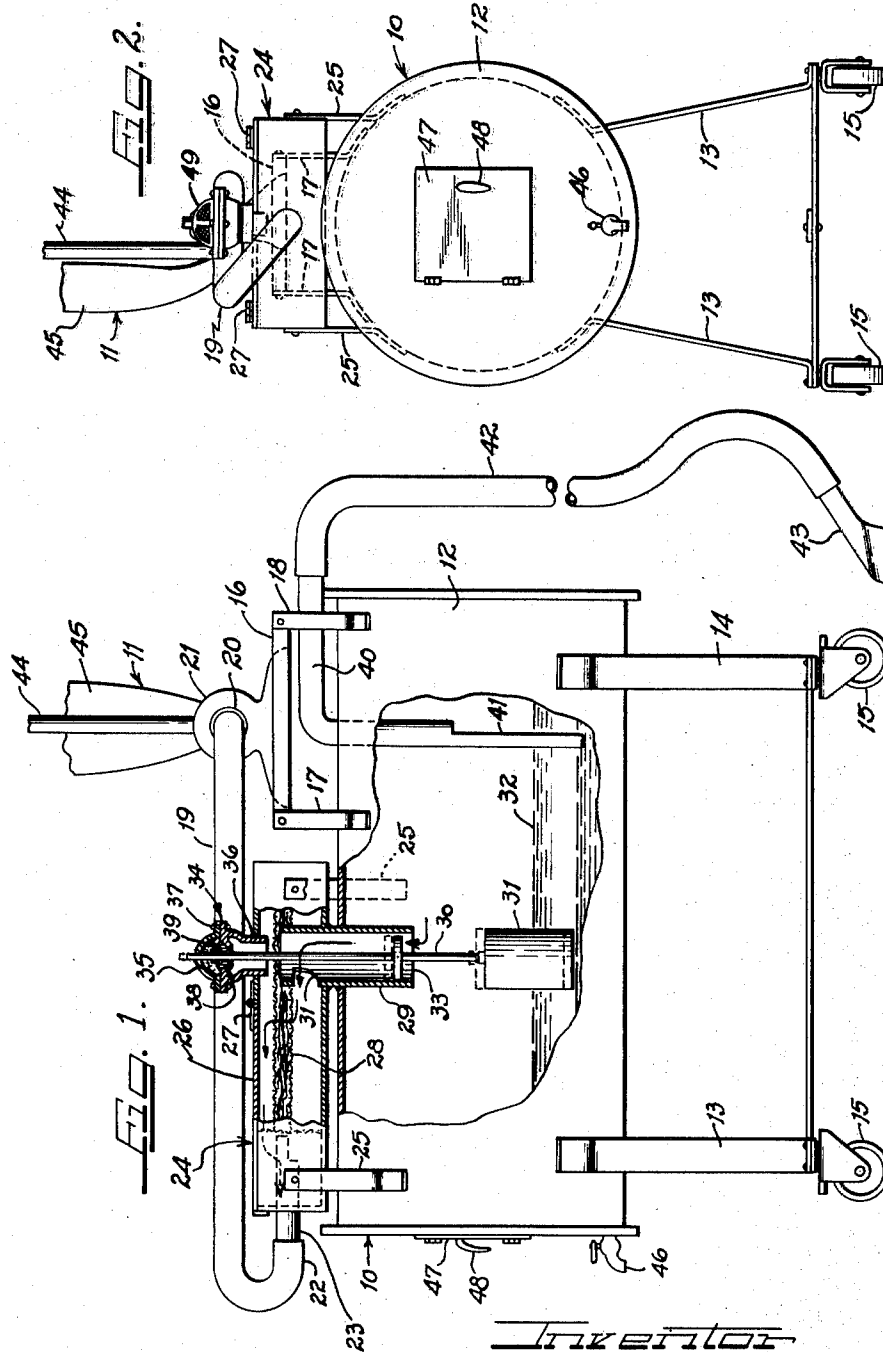
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CLEANING APPARATUS

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CLEANING APPARATUS

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This invention relates to improvements in cleaning apparatus and more particularly to the depositing chamber therefor, wherein the air is relieved of dirt, dust and water or other cleaning liquids removed from the articles cleaned.

The usual vacuum cleaning apparatus removes dirt and dust from rugs, carpets, tapestry, upholstered work, and the like. Cleaning operations are performed on dry articles because the mechanism of the vacuum cleaner is not constructed to remove or hold liquids. To do so would require waterproofing, by shielding or other means, of the electric motor which drives the suction fan and providing a watertight depositing container other than the usual dust-proof fabric or paper bag.

The dry removal of dust and dirt by a suction type vacuum cleaner is not entirely satisfactory. During cleaning operations, much of the disturbed dust becomes suspended in the surrounding air and thereby escapes the cleaner. The result is unhealthy both because dust and germs are inhaled and because they come in contact with the mouth, after settling on eatables, cooking and eating utensils, drinking cups and glasses, toothbrushes, medical and dental instruments, and the like.

My invention seeks to eliminate these objectional features in suction cleaners. By scrubbing with soap and water, or other cleaning liquids, the particles of dust and dirt or other solids in the articles to be cleaned are picked up by the solution and carried in suspension. This eliminates the dust becoming air-borne. In removing from the articles to be cleaned the cleaning liquid containing the particles of dirt, however, it is not possible to do so by the usual types of vacuum cleaners as they are not constructed either to remove or to hold liquids. It is necessary, therefore, to provide apparatus which will remove cleaning liquids from articles being cleaned and to collect both the liquids and any suspended particles of dirt for disposal.

Accordingly, it is an important object of my invention to provide cleaning apparatus capable of removing dirt-laden cleaning liquids from articles cleaned and collecting the liquids for disposal.

Another object of the invention is to provide a suction operated depositing chamber for cleaning apparatus which chamber is so constructed that air drawn from an article being cleaned and carrying dislodged dirt and liquid to the chamber is completely relieved from its load of foreign matter thereby effecting the flow of clean, moisture-free air to the suction side of the chamber.

A still further object of this invention is to provide in cleaning apparatus a suction operated depositing chamber having means for cutting-off

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the suction therefrom whenever deposited liquid in the chamber rises to a predetermined level.

Still another object of this invention is to provide in cleaning apparatus a depositing chamber for receiving dirt-laden moisture and liquid and which apparatus is actuated by any source of suction or vacuum including a house-type vacuum cleaner.

Another and further object of this invention is the provision of cleaning apparatus which is portable and easily transported from place to place and yet sufficiently large to receive cleaning liquid from large areas.

Another and still further object of this invention is the provision of an improved cleaning apparatus which is simple in construction, economical to manufacture, and highly efficient in operation.

Other and further objects of the invention will become apparent to those skilled in the art from the following detailed description of the preferred embodiment of the invention as disclosed in the annexed sheet of drawings.

On the drawings:

Figure 1 is a side view in elevation, partly fragmentary and partly in cross-section, illustrating details of construction of a cleaning apparatus embodying principles of my invention; and,

Figure 2 is an end view thereof.

As shown on the drawings:

The cleaning apparatus illustrated includes a depositing chamber construction 10 into which moisture or liquid and dirt laden air is caused to flow by means of a source of suction which, in the present instance, is a house-type vacuum cleaner 11. The chamber comprises a tank or reservoir 12 supported on legs 13 and 14 which have casters 15 mounted thereon for transportability of the apparatus.

A shelf 16, connected to the tank by means of legs 17 and 18, supports the vacuum cleaner 11 in order that the apparatus be transportable as a unit. It is to be understood, however, that this invention is not confined to the combination with a vacuum cleaner as any source of suction may be used equally as well. In the usual construction of a vacuum cleaner, there is provided an opening in the suction fan casing to which cleaner attachments may be removably fastened. As shown in Figure 1, a flexible hose 19 is connected at one end 20 by any suitable means to the suction casing 21. At its other end 22, the hose is attached by means of a tubular nipple 23 to a filter or moisture trap 24.

For purposes of convenience only, the filter construction is removably mounted on the tank by means of legs 25, 25. This construction permits ready access through a cover 26 hinged at 27, 27 but which normally is kept tightly closed. As shown, a matting of suitable fibrous material 28

is provided as a filter, the function of which is more fully described hereinafter.

Extending between the filter 24 and the tank or reservoir 12 is a cylinder 29 having one end terminating under or within the fibrous matting and its other end terminating in the upper portion of the tank. If desired, the upper end may be sealed and an opening provided in the cap to act as a bearing for a valve actuating stem 30. In either construction, an opening such as 31 is provided through a sidewall of the cylinder. This opening provides both a pathway for fluids flowing up through the cylinder to pass through the filter matting 28, for a reason to be fully explained later, and a drainage opening for any moisture or liquids removed by the filters.

At the lower end of the stem 30 is secured a float 31 of sufficient weight to maintain the stem in its lower most position but light enough to rise with the level of liquid 32. A guide member 33, carried by the stem, is movable within the cylinder to constantly maintain the stem in a centered position therein.

A valve 34 is carried by the cover 26 of the filter 24. The valve includes an upper section 35 and a lower section 36 bolted or otherwise secured together as at 37. Valve section 36 is provided with a transverse wall having a tapered opening therethrough defining a valve seat 38. A tapered valve 39 is carried by the stem 30 and normally complementally seats on the valve seat 38 thereby limiting downward movement of the float.

At one end of the tank 12 there is provided a tubular member 40 terminating within the interior of its tank in a deflector or baffle 41. The other terminal of the tubular member has attached a hose 42 having on its free end a broom or suction nozzle 43.

The operation of the device is as follows: The suction source, in this case a vacuum cleaner 11 of the hand operated type having a handle 44 and a dust collecting bag 45, is set in operation. Suction is then exerted through the hose 19, the reservoir or tank 12, and the hose 42. As the broom or suction nozzle 43 is moved over a surface which has been scrubbed with a cleaning liquid, the liquid and any dust or dirt held in suspension is mixed with air and drawn through the hose 42 into the tank 12. Baffle 41 is sufficiently long to permit liquid and solids of dirt and dust held in suspension to run to the bottom of the tank where the solids precipitate. The baffle tends also to minimize agitation thereby aiding in the settling of foreign matter in the tank. When it becomes necessary, collected liquids may be drained away through faucet 46. A door 47 makes the interior of the tank accessible for cleaning purposes. This door is normally locked by a latch 48.

Suction exerted by the vacuum cleaner through the filter 24 draws moisture-laden air along a path indicated by arrows. This path is upward through the cylinder 29 and the filter matting 28, and into the nipple 23 and hose 22. The air finally is exhausted through the cleaner collecting bag.

Inasmuch as the vacuum cleaner is of a non-waterproof type, it is necessary to remove any moisture from the air before it reaches the cleaner. This is done in the filter matting 28. A fibrous matting is provided which is inert or impervious to water or other cleaning liquids used. Such a matting could be formed of glass fibers, hair, bristles, fine wire, filaments of metal, or

any other material not affected by the cleaning liquid. Filtered moisture and liquid flows through the opening 31, down the cylinder, and back to the tank.

As the level of deposited cleaning liquid 32 rises, the weight of float 31 resists movement until it becomes buoyant. This buoyancy level is predetermined for at that level the mechanism now to be described automatically cuts off the flow of air from the interior of the tank through the filter.

The float 31 is normally positioned as shown in full lines in which position the valve 34 is closed. When the float becomes buoyant it rises to a position shown in dotted lines and the valve 34 is opened as the tapered valve member 39 rises from its seat 38. With the valve opened, suction from the vacuum cleaner is exerted on the atmosphere rather than through the fibrous matting 28. A screen 49 is provided on the dome of the valve to eliminate the entry of dust, dirt and other foreign matter. It then becomes necessary to draw off excess cleaning liquid from the tank 12 until the float again drops to its lower most position to close the valve 34.

It will be apparent that my cleaning apparatus particularly lends itself to operations wherever it is desired that dust and dirt not be disturbed during cleaning. The use of such apparatus has been found to be especially desirable in medical, dental and food establishments.

The invention has been described herein more or less precisely as to details, yet it is to be understood that the invention is not limited thereby, as changes may be made in the arrangement and proportion of parts and equivalents may be substituted, without departing from the spirit and scope of the invention.

I claim as my invention:

1. In cleaning apparatus adapted for connection to and operation with a source of suction such as a vacuum cleaner whereby to remove dirt solids and cleaning liquids from articles cleaned, a depositing chamber into which air laden with said solids and liquids are drawn by said suction, a filter chamber having therein a fibrous matting filter, a tubular member connecting said filter and depositing chambers and defining a pathway for the flow of air therebetween and through said fibrous matting, a suction pathway connecting the source of suction with said filter chamber on the side of the fibrous matting opposite the connecting cylinder, a valve connecting the atmosphere to the same side of the filter chamber as the source of suction, said valve having a seat and a closure member, a float, and a shaft connecting said float and valve closure member, the weight of said float being such as to effect buoyancy thereof at a predetermined level of collected liquid in said depositing chamber whereby to open said valve, said valve when opened connecting said source of suction with the atmosphere and when closed connecting the source to said depositing and filter chambers whereby to draw air from the depositing chamber through the filter chamber.

2. In cleaning apparatus adapted for connection to and operation with a source of suction such as a vacuum cleaner whereby to remove dirt solids and cleaning liquids from articles cleaned, a depositing chamber into which air laden with said solids and liquids are drawn by said suction, a filter chamber having therein a fibrous matting filter, a cylinder connecting said filter and depositing chambers and defining a pathway for

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the flow of air therebetween and through said fibrous matting, a suction pathway connecting the source of suction with said filter chamber on the side of the fibrous matting opposite the connecting cylinder, a valve connecting the atmosphere to the same side of the filter chamber as the source of suction, said valve having a seat and a closure member adapted to engage said seat and close the valve, a float, a shaft extending through said cylinder and connecting said float and said valve closure member, and a guide member in said cylinder for maintaining said shaft in centered alignment therein and said valve parts in alignment with each other, the weight of said float being such as to effect buoyancy thereof at a predetermined level of collected liquid in said depositing chamber whereby to effect opening of the valve, said valve when opened connecting said source of suction with the atmosphere and when closed connecting the source to said depositing and filter chambers whereby to draw air from the depositing chamber through the filter chamber.

3. In cleaning apparatus adapted for connection to and operation with a source of suction, a depositing chamber into which air laden with solids and liquids are drawn by said suction, a filtering chamber having therein a filter, a fluid flow passageway connecting said depositing and filtering chambers and defining a pathway through said filter, a suction pathway connecting

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the source of suction with said filtering chamber, a valve connecting the filtering chamber to the atmosphere, and a float member operatively connected to said valve, the weight of said float being such as to effect buoyancy thereof at a predetermined level of collected liquid in said depositing chamber whereby to open said valve, said valve when opened connecting said source of suction with the atmosphere and when closed connecting the source to said depositing and filtering chambers whereby to draw air from the depositing chamber into the filtering chamber and through said filter.

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