

[54] POOL VACUUM SYSTEM
 [76] Inventors: John Goertzen, III, 20212 Septo St., Chatsworth, Calif. 91311; Robert W. Hargrave, 7722 Glassport, Canoga Park, Calif. 91304

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 Attorney—Jack C. Munro

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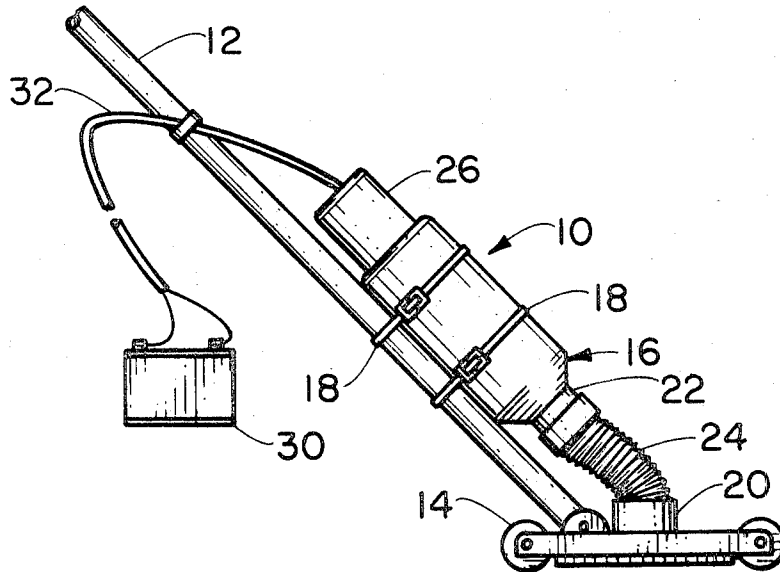
[57] ABSTRACT

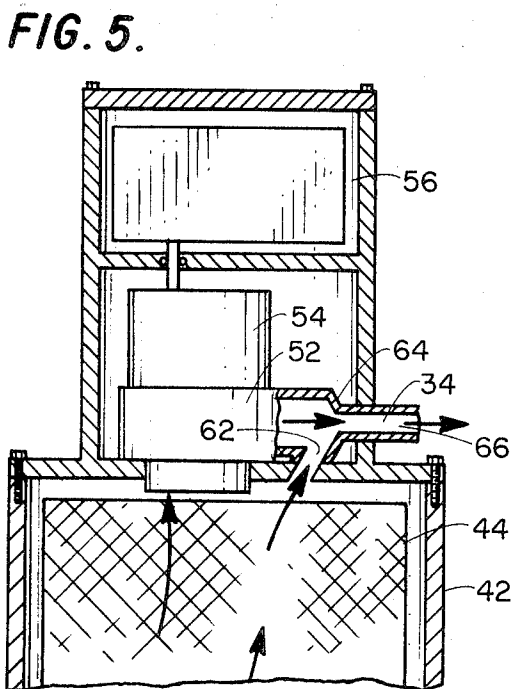
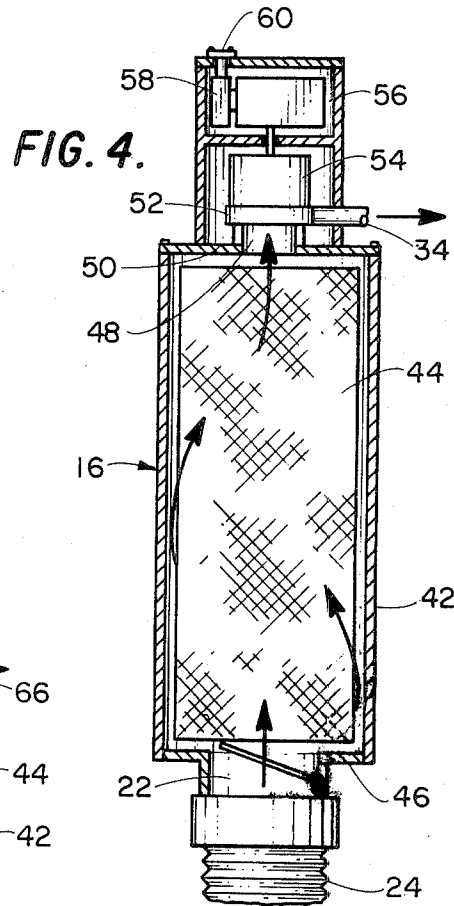
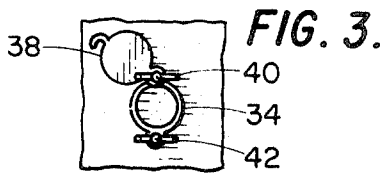
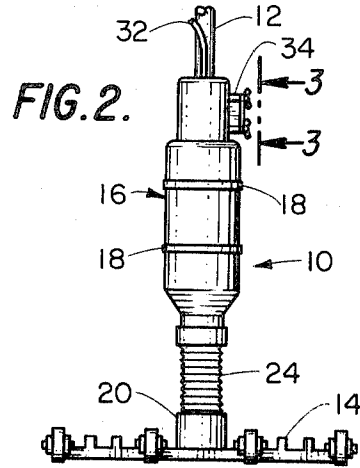
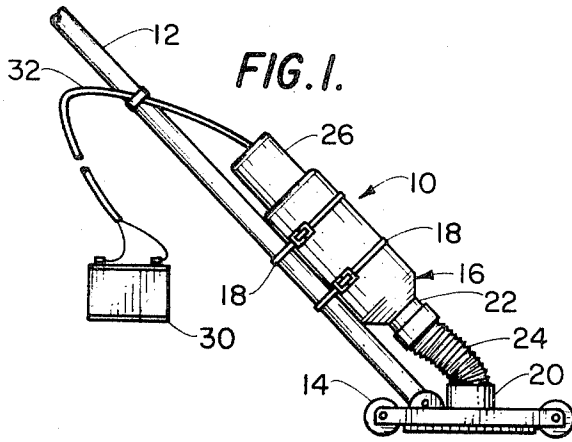
Herein described is a fully contained pool cleaning and vacuuming system. The system includes a housing in the form of a canister enclosing a filtration element therein which is directly attachable to a vacuum head by a flexible tube. A pump is disposed in the canister along with a power source for moving the water from the vacuum head through the filter unit.

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10 Claims, 5 Drawing Figures





INVENTORS.
JOHN GOERTZEN III
ROBERT W. HARGRAVE
BY
Victor Sepulveda
ATTORNEY

POOL VACUUM SYSTEM

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to pool cleaning apparatus and more particularly to a novel and improved fully contained pool vacuuming system which is directly attachable to a pool vacuum head and the guide pole and the like.

2. Discussion of the Prior Art

In swimming pool installations, it is a common practice to employ a filtration circulation system whereby the pool water is continuously drawn from the pool by a pump and through a main filter and returned to the pool. The conventional circulation system for a swimming pool includes a drain at the deepest portion and a skimmer with a secondary outlet near the water surface. Conduits from these are joined to feed the pump which returns the water to the pool. A filter and frequently a heater are interposed in this system.

Silt, sand, sediment, small leaves, and other undesirable debris, which drift towards the drain are removed by the suction therethrough. Larger leaves may have to be scooped out. Surface dust and other flowing foreign matter is taken off through the skimmer by the suction afforded by the secondary outlet. In addition, various periodic cleaning is accomplished by brushing and/or vacuuming the walls and bottoms by hand manipulated brushes or water vacuum cleaners. The water vacuum force is attained by a hose connection with the secondary outlet. Usually the connection of the vacuum hose cuts off circulation from the main drain to increase the flow rate to the secondary outlet. These methods have proven in the past to be quite time consuming and costly from a labor standpoint.

Various automatic pool cleaning equipment have been proposed, some use a jet stream of water on the end of hoses to stir up the water and loosen the dirt so that it will be in suspension to flow through the drain. Another form utilizes a machine, which travels around on the coping of the pool and drags their vacuum device. Yet, still other devices for this purpose are of the type which crawl on wheels or tracks across the bottom of the pool and vacuums as it travels. None of these prior art devices fulfill the present need for a fully self contained pool cleaning and vacuuming unit.

The vacuum devices of the prior art usually require that a hose be connected to a pool vacuum head submerged in the water and connected up to the presently used filtration system. The necessity of bringing out a hose of considerable length to do the entire pool, is quite annoying and inconvenient, especially should it be a desire for the pool owner to clean his own pool. Further those who are in the business of pool cleaning services find this quite time consuming to have to connect a hose up to the present system of the pool owner, each time a pool is to be cleaned. In some cases, it is found that the pumps of the pool owner are defective and therefore do not pump at the necessary pressure, in order so that the pool cleaning servicemen can do a good efficient job in the shortest possible time.

Thus, the need has arisen for a fully self-contained self-powered pool cleaning apparatus which can be connected directly onto the guide pole which is used to guide the vacuum head over the bottom of the pool and which can also be connected into the vacuum head, so that a pool may be rapidly and readily cleaned without

the necessity of various aforesaid connections. Further, the need is for the elimination of the extra long hoses to perform the above cleaning functions. Further, it is desirable that a device be constructed so that cleaning the filtration system of a self-contained pool vacuum can be easily and swiftly accomplished.

It should be realized that after a pool has been cleaned by the prior art devices, it becomes necessary to clean the filtration system more frequently, because the silt and sediments which had formally settled to the bottom of the pool is now in the filter system.

SUMMARY OF THE INVENTION

The present invention as set forth in the specific embodiments to follow, accomplish all the desired results heretofore set forth and overcome all the undesirable results of the prior art.

Briefly described, the present invention comprises swimming pool apparatus having an elongated guide pole, a conventional vacuum head is mounted on one end of the pole whereby the pole facilitates movement of the head over the bottom surface of the swimming pool. Next, a housing is provided which is typically, as described in the specific embodiment, a cylindrical shaped canister and has an inlet disposed on the bottom end thereof and an outlet near the top. The housing is mounted to the elongated guide pole. A filtration cartridge or unit is disposed within the housing and is connected into the vacuum head by a conduit, preferably a flexible hose. Means is disposed near the top end of said housing for causing the water to flow from the vacuum head into the inlet in the housing and through the filtration unit and out the outlet of the housing. In one embodiment, a power source, (which may preferably be a battery), is disposed within the housing and may be disposed within a waterproof compartment. The means for causing the water flow may be in the form of a submersible pump, which is mounted in communication with the filtration unit. A flange or the like is coupled to the outlet of the housing for closing off the outlet when drawing the apparatus out of the swimming pool. This closure prevents water from flowing out of the bottom end of the filtration cartridge and dumping the debris and sediment contained therein, back into the pool.

In a further embodiment of this invention, a second outlet is provided in the housing and communicates with the first mentioned outlet. A restrictive area is provided in the original outlet and near the second outlet for creating a Venturi effect to draw the water through the second outlet and thereby increase the flow rate through the filtration unit.

DESCRIPTION OF THE DRAWING

These and other features and advantages will become more apparent to those skilled in the art, when taken into consideration with the following detailed description, wherein like reference numerals indicate like and corresponding parts throughout the several views and wherein:

FIG. 1 is a side view of a swimming pool cleaning and vacuuming apparatus incorporating the present invention;

FIG. 2 illustrates a front view of a swimming pool cleaning and vacuuming apparatus shown in FIG. 1;

FIG. 3 is a partial side view taken along the lines 3—3 of FIG. 2 illustrating the shut off closure flange;

FIG. 4 is a section view illustrating the positions of the filter, pump, pump motor and power source of the apparatus shown in FIG. 1 and FIG. 2; and

FIG. 5 is a section view of another embodiment of a swimming pool cleaning and vacuuming apparatus constructed in accordance with the principles of the present invention which illustrate an internal power source.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning now to a more detailed description of this invention and particularly described, the embodiment for carrying out the present invention, there is shown in FIG. 1, pool cleaning apparatus 10 which includes an elongated guide pole 12 and a swimming pool vacuum head 14 which is constructed in a manner well known to those skilled in the art and may be of the type for example, which is found in U.S. Pat. No. 3,273,188. A self-contained filtration unit 16 which is constructed in accordance with the principles of this invention is connected to the guide pole 12 in a conventional manner such as by use of straps 18 thereon. A vacuum head 14 includes thereon, a suction connection sleeve 20, which in the prior art devices is connected directly into the pump of the filter system of the pools original equipment. But in accordance with the teachings of the present invention, the connection sleeve 20 is connected into a matching inlet connection sleeve 22 in the filtration unit 16 by a suitable flexible hose 24. The purpose of this connection is to allow filtration of the water picked up by the head 14 to be processed solely within the filtration unit 16.

Mounted within the top end 26 is a suitable water pump to be explained in detail later. The pump, may in this embodiment, be coupled to a battery and for example, an ordinary automobile storage battery 30 via a waterproof cable 32. As shown in FIG. 2, an outlet 34 is mounted near the top 26 of the filtration unit 16. When the submersible pump within the filtration unit 16 is energized, water is drawn from the vacuum head 14 through the flexible hose 24 and into the filtration unit 16, where it is filtered, and out the top outlet 34.

FIG. 3 illustrates a flange 38, which is mounted by thumb screws 40 and 42, to facilitate shutting off the water from the outlet 34, so that when the filtration unit guide pole 12 and vacuum head 14 is removed from the water, the water will not backflow from the filtration unit 16 back into the swimming pool to further contaminate it with the sediment and other debris from the filtration unit 16. In some instances it may be desirable to install a check valve (flapper valve) in the bottom portion of housing 42 to stop the backflow when removed from the water. Thus it is not necessary to physically open and close the backflow prevention mechanism.

The filtration unit 16, as shown in FIG. 4, is comprised of an outside housing 42 which is generally cylindrical in shape. The housing 42 may for example, be constructed of plastic or other suitable light weight material, and has contained therein a suitable filter 44 which may for example, be a filter strainer unit, filter bag, of any conventional design capable of filtering the sediment, silt, dirt and other debris from the bottom of the swimming pool. Specifically the filter housing 42 has a bottom end 46 having a suitable inlet connection sleeve 22 thereon, which is adapted to receive the flexible hose 24 in a manner heretofore described. Preferably

the filter 44 communicates directly with the sleeve 22 so that as the water flows into the housing 42 through sleeve 22 in the end 46, it flows on the inside of the filter 44, whereby all the debris which is over a predetermined size is collected therein. The filter 44 is preferably comprised of a cloth like material which has a fineness, sufficient for the purpose intended. The water though, flows through the filter 44 and into the inner chamber of the housing 42. Directly coupled to an opening 48 in the top end 50 of the housing 42 is a suitable water pump 52, which draws the water from the inner chamber of the housing 42 and out the outlet 34 which extends outside the housing 42. Preferably the outlet 34 is disposed a suitable distance from the bottom of the pool, so that it does not affect the debris which is on the bottom thereof. Otherwise, if the debris were suspended into the water, it becomes difficult for the vacuum head 14 to pick it up. The pump 52 is preferably a submersible type which is water tight, so that the water does not affect an electrical motor 54, therein as shown in the embodiment in FIG. 4. The housing 42 may have a waterproof compartment 56 where a suitable battery 55 is mounted therein to power the electrical motor 54. A suitable converter 58 may be disposed in compartment 56 with the battery 55 communicating with the outside of the housing 42, but covered therewith by a suitable waterproof flange 60. When the flange 60 is removed, an electrical outlet from an electrical power source can be coupled directly into the converter 58 where the voltage is converted to a potential suitable to charge the battery therein.

With reference now to FIG. 5, there is shown therein, a further embodiment of this invention, whereby a further opening 62 is provided in the top 50, the housing 42 and is connected directly into the outlet 34. Note in this embodiment there is a restrictive portion 64 in the outlet 34 which creates therein a Venturi effect forming the Venturi portion 66 therein. As the water is pumped by the pump 52, out the outlet 34, extra suction is provided in the opening 62 via the restrictive area 66 to aid in the pumping of the water through the filter 44 and increasing the flow rate thereof. This creates an improvement because all air is quickly drawn from the inner chamber of the housing 42 eliminating cavitation and the need for priming the pump when first turning on the unit.

Having thus described one preferred embodiment of this invention, what is claimed is:

1. A swimming pool cleaning apparatus including:
 - a vacuum head for being moved over the bottom surface of a swimming pool;
 - a housing having a top end and a bottom end, an inlet on the bottom end and a outlet near the top end thereof, said housing being mounted to said vacuum head;
 - a filtration unit in said housing;
 - a conduit coupled between said vacuum head and the inlet in said housing communicating with said filtration unit;
 - means disposed near the top end of said housing for causing water to flow from said vacuum head into the housing through the inlet end and through said filtration unit and out the outlet of said housing ;
 - and
 - means coupled to the outlet of said housing for closing said outlet.

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2. The apparatus as defined in claim 1 and further including a power source disposed in said housing for driving means.

3. The apparatus as defined in claim 1 and wherein said means including a submersible electric pump mounted in communication with said filtration unit.

4. The apparatus as defined in claim 3 wherein said electric pump being mounted in said housing and further including a power source in said housing and being coupled to said pump.

5. The apparatus as defined in claim 1 and further including means coupled to the outlet of said housing for closing said outlet.

6. A swimming pool cleaning apparatus including: a vacuum head mounted for being used over the bottom surface of a swimming pool;

a housing having a top end and a bottom end, an inlet on the bottom end and a first outlet near the top end thereof, said housing being mounted to said vacuum head;

a filtration unit in said housing; said vacuum head communicating with said filtration unit in said housing;

means disposed near the top end of said housing for

causing water to flow from said vacuum head into the housing through the inlet end and through said filtration unit and out said first outlet of said housing;

a second outlet in said housing and communicating with said first outlet;

a restrictive area in said first mentioned outlet and near the second outlet for creating the Venturi effect to draw water through said second outlet to increase the flow rate through said filtration unit.

7. The apparatus as defined in claim 6 and further including a power source disposed in said housing for driving said means.

8. The apparatus as defined in claim 6 and wherein said means including a submersible electric pump mounted in communication with said filtration unit.

9. The apparatus as defined in claim 6 wherein said electric pump being mounted in said housing and further including a power source in said housing and being coupled to said pump.

10. The apparatus as defined in claim 6 and further including means coupled to the outlet of said housing for closing said outlet.

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