Oct. 29, 1963 R. J. GELINAS 3,108,298

SWIMMING POOL CLEANER

Filed April 3, 1963

FIG. 1.

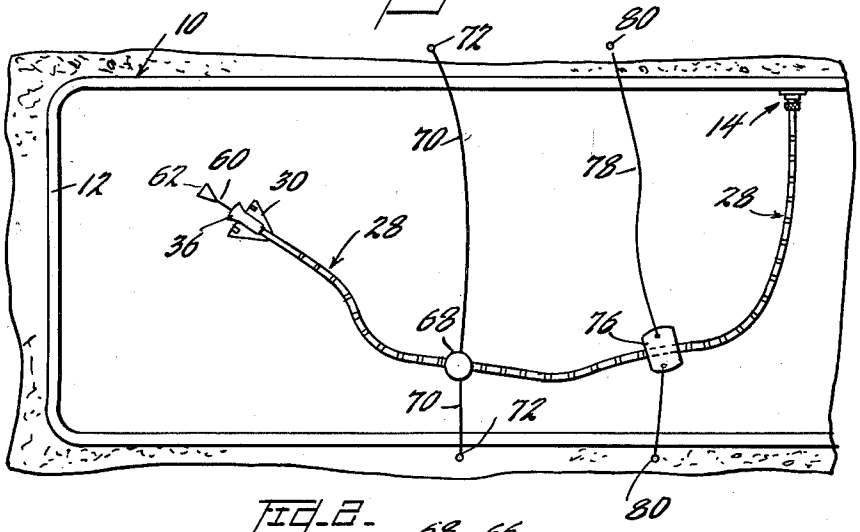


FIG. 2.

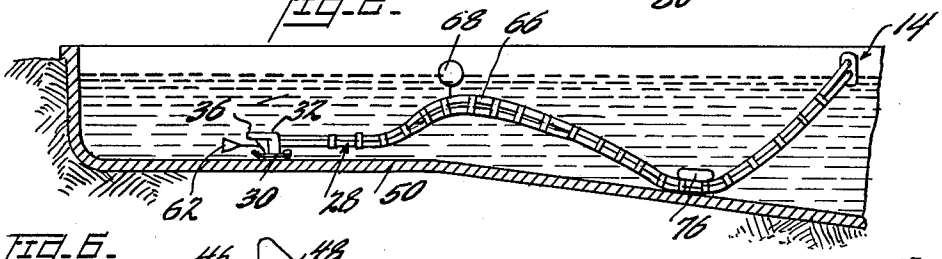


FIG. 6.

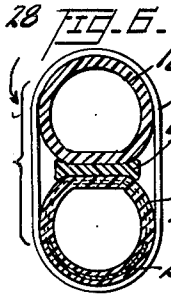


FIG. 3.

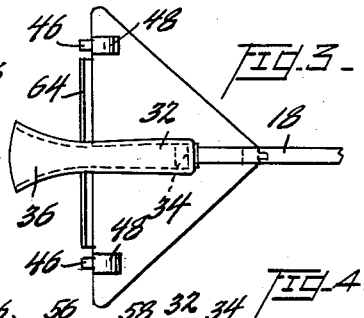


FIG. 7.

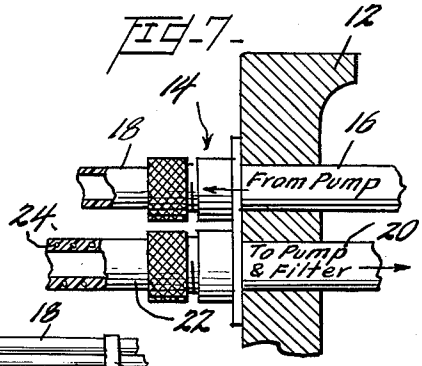


FIG. 4.

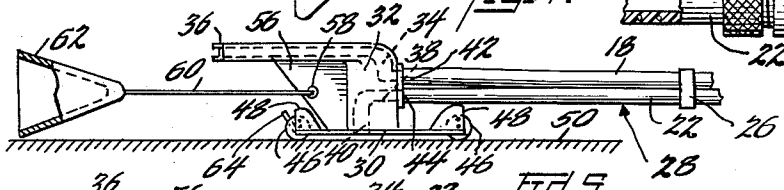
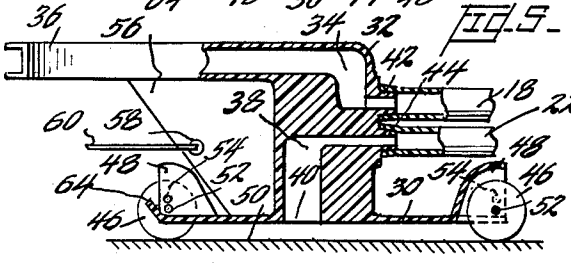


FIG. 5.



INVENTOR

R. J. Gelinas

Parker and Ubell

ATTORNEYS

United States Patent Office

3,108,298

Patented Oct. 29, 1963

3,108,298

SWIMMING POOL CLEANER

Ralph J. Gelinas, 13837 Burbank Blvd., Van Nuys, Calif.

Filed Apr. 3, 1963, Ser. No. 270,389
16 Claims. (Cl. 15—1.7)

This invention relates to an apparatus for cleaning swimming pools.

Cleaning of the sediment deposited on the walls and bottom of swimming pools is an item of substantial expense at the present time. Although the larger pools are usually provided with a filter system, which draws water continuously from a low point in the swimming pool floor, filters it and returns it to a remote point in the pool, much sediment tends to cling to the floor and walls of the pool without being disturbed by the relatively gentle circulation resulting from operation of the filter system.

One effective method for removing the sediment is to manually guide over the floor and walls of the pool, a suction head, similar to the suction head of a domestic vacuum cleaner, such head being connected by a hose to the intake of a suitable pump. The water thus withdrawn from the pool may be filtered and returned to the pool or it may be discharged to the sewer with the addition of fresh water to the pool.

It has been proposed to facilitate the removal of swimming pool sediment by simply disturbing it by purely mechanical means such as brushing or by a hydraulic jet. For example, a conventional garden hose of sufficient length, with a discharge nozzle adjusted to produce a jet stream of substantial force may be thrown into a pool. The random movement of the discharge head, driven by the force of the discharged stream of water, will cause the discharge head to stir up much of the sediment, provided sufficient time is allowed. However, it is more likely than not that, with the usual capacity of swimming pool filter systems, the sediment thus disturbed, will again settle to the bottom of the pool rather than being caught in the filter circuit.

It has also been proposed to suspend from a movable arm, a relatively short hose capable of movement over a limited area of the pool floor by jet reaction. Attached to the jet head and positioned somewhat to the front of it may be a bucket-like mouth connected by a separate conduit to the suction side of the filter to gather up and carry away the sediment disturbed by the jet. The apparatus needed for moving the arm over the face of the pool is of substantial character and requires the attendance of an experienced operator.

The apparatus of my invention is designed to be operated in association with a conventional swimming pool filter and requires only a pair of connections, one from the pump discharge and the other to the suction inlet of the filter. If a filter is not available, the apparatus may be used with a suction pump discharging into a sewer line, making use of the fresh water supply used in filling the pool.

The apparatus is entirely self actuated and can be managed by members of the pool owner's family. Additionally, its cost of construction is relatively low, making possible for the individual pool owner to purchase his own equipment.

My invention includes a pair of hoses secured together over the major portion of their length. One of these is connected to a source of water under substantial pressure, so that it may function to cover the floor and walls of the pool in random fashion. The second line is connected to a source of suction, usually the suction inlet of the pool filter. The outer ends of the two hoses are supported by a planchette device supported for rolling movement

over the floor and wall of the pool with the suction fitting opening on the underside of the planchette. Thus, the suction communicated through the one hose tends to hold the planchette against the surface being cleaned while the discharge of the pressure hose above, propels the planchette over the surface. The movement of the planchette is further controlled by means of a directional fin attached to the planchette and by a hydraulic brake.

Reference should now be made to the drawing forming a part of this application wherein:

FIGURE 1 is a plan of approximately half of a pool, showing the cleaning apparatus in operation, the whole being drawn to a very greatly reduced scale;

FIGURE 2 is a section corresponding to FIGURE 1;

FIGURE 3 is an enlarged plan view of the planchette and hose fitting;

FIGURE 4 is an elevation similar to FIGURE 3 showing the planchette, the hydraulic brake and the outer portion of the hoses;

FIGURE 5 is an enlarged portion of FIGURE 4, partly in section;

FIGURE 6 is a section of the hose pair showing a stiffening member used at one point along the hose; and

FIGURE 7 shows a suitable hose fitting at the pool edge.

The invention is shown in FIGURES 1 and 2 in connection with a swimming pool 10, only half of which is shown, having a surrounding coping 12. In order to utilize a cleaning device of minimum hose length, it is desirable to have a fitting 14 located along one of the side walls at approximately the middle thereof. It is contemplated that for new installations, the fitting 14 will be included in the side wall of the pool closely adjacent the water line. In old installations, hose connections may be led from the filter to the point indicated. For purposes of cleaning the pool, a fresh water line may be substituted for line 16 and the suction line of a suction pump, not shown, may be substituted for the line 20, the discharge side of the pump being arranged to discharge into the sewer. As shown, the discharge line 16 from the filter pump is connected to the fitting 14 to discharge into the hose 18 and the suction leading line 20 from the filter is connected through the fitting to the hose line 22.

In practice, I have employed extruded vinyl hose of 1 inch inside diameter for the hose designated 18. For the hose designated 22, I use a light weight polyethylene hose of 1 inch effective inside diameter, having a spiral wire reinforcement 24 to prevent internal collapse. At intervals of about 1 foot, or ten to fifteen times the hose diameter except as noted hereafter, the hoses are held closely together by resilient plastic bands 26. The vinyl hose 18 is slightly less buoyant than water while the polyethylene hose 22 has a positive buoyancy. As a pair, the wrapped unit 28 has a neutral buoyancy or may be fractionally lighter. About 2 to 3 feet from the outer end of the paired hoses 28, the bands 26 are left off, to permit some degree of relative sidewise movement between the two elements 18 and 22.

An approximately triangular planchette 30 may have a combination fitting 32 cast integrally with the planchette 30 or it may be formed separately and secured as by screws. The upper portion of fitting 32 contains a passage 34 leading to a jet discharge nozzle 36 for discharging a fan shaped jet of water, the plane of the fan being substantially parallel to the planchette. Below the discharge passage 34 is a corresponding passage 38 leading to a suction opening 40 on the underside of the planchette. The planchette or plate surrounding the suction opening extends outwardly beyond the opening at least 3 times the diameter of the opening. The hoses 18 and 22 are connected to the passages 34 and 38 by swivel connections 42 and 44 respectively, permitting some cir-

cular adjustment of each of the hoses with respect to the fitting without significant leakage.

The planchette 30 is provided with a set of three wheels 46, mounted in housings 48. In operation, the suction exerted through the opening 40 will tend to hold the wheels 46 of the planchette firmly against the floor or walls 50 of the pool while permitting the planchette to move about impelled by nozzle 36. In order to accommodate different finishes of the surface 50 and to provide a variety of response to the suction, the height of the planchette plane above the surface 50 may be regulated by the location of the wheel axles 52 by providing several journal openings 54 in the housings 48.

If the stream of water conveyed through hose 18 were allowed to rush unimpeded from the jet opening 36, the planchette 30 would be subject to rather violent motion over the surface 50 but the suction applied through passage 40 tends to hold the planchette 30 rather firmly upon the surface 50.

One or more of three expedients are employed to ameliorate the violence of movement of the planchette to cause it to move more smoothly and more efficiently. A vertical rib 56 may be provided to support the jet discharge 36, connecting with the upper surface of the planchette 30. The rib 56 affords some desired resistance to sidewise whip of the planchette 30 without eliminating it altogether.

A hole 58 in the rib 56 affords anchorage for a nylon line 60 to which is tethered the polyethylene cone 62, which acts as an hydraulic brake. A cone 62 is open at the rear and serves to give the planchette 30 a steadier forward movement as it progresses over the surface 50. The cone is significantly buoyant and aids in maintaining the planchette right side up when sidewise whipping of the hose pair 23 causes the planchette to become inverted temporarily.

Additionally, an elevator fin 64 may extend upwardly and outwardly from the rear edge of the planchette 30. This also helps to hold the planchette down against the surface 50. By making the position and inclination of this fin adjustable, the performance characteristics of the planchette may be somewhat adjusted to accommodate the planchette to varying pool conditions.

Although it is natural for the free end of a jet discharge hose to whip about, the relative variations in pressure in the two lines 18 and 22 tend to accentuate this and I find that this is magnified by the fact that the two lines are held closely together by the bands 26, except over the last 2 or 3 feet before they are joined by the swivels 42 and 44 to the fitting 32. This construction also facilitates the righting of the planchette when it becomes reversed.

It is advantageous to place some limitation on the amount of whipping of the hose pair 28. The fan shaped stream of water issuing from jet 36 has a useful sweeping action, especially upon the sides of the pool and the random movement of the outer end of the line affords the necessary coverage of the surface 50 but needless motion of the remainder of the line would only serve to stir up the sediment in suspension at points remote from which it could be removed from the pool so that no significant good would be accomplished. I have found that, with the apparatus sizes heretofore mentioned that, about 6 to 12 feet of free hose at the end are most effective. Accordingly, where the total hose length may be 50 to 60 feet, or in excess of 200 times the hose diameter, beginning about 10 feet back from the jet discharge, that is about 75 to 100 hose diameters back from the jet discharge, I insert a relatively flat stiffening member 66 for about 10 feet. This stiffener 66 may be a plastic extrusion or it may be non-corrodible metal. By reason of its flatness, it holds the hose pair 28 straight along its length while permitting considerable flexibility as the hose is lifted up. About 2 feet back from the outer end

of the stiffener 66, that is about 75 to 100 hose diameter back from the jet discharge, I use a light float 68 separated from the hose pair 28 by about 1 foot of nylon cord. In this way, the outer end of the hose pair is supported for freedom of movement in much the same fashion as a vacuum cleaner wand is held in the hand of a housewife while the remainder of the hose pair 28 trails behind, out of the way.

As one section of the pool is cleaned, the area in which the planchette is free to operate may be changed by moving the location of the float 68. This is accomplished by a pair of cords 70 secured to the hose pair 28 at the point of suspension and extending to the banks of the pool on each side. A pair of wood stakes 72 or other suitable anchoring devices may be used to hold the cords in place. If the section of the line 28 between the filter fitting 14 and the stiffened portion proves to be too buoyant, it may be held in place by one or more sand bags 76. These bags may be moved by means of a pair of lines 78 operated from the banks of the pool and held in place by stakes 80.

The apparatus of this invention is efficient in cleaning both the walls as well as the bottom of most pools, it can be operated in safety by unskilled persons and without entering the pool. It is inexpensive and requires no additional equipment beyond that already available to the pool owner; finally, it is adaptable to all sizes of pools merely by the choice of the length of the hose.

I claim:

1. Means for cleaning a swimming pool with the aid of a source of clean water and a source of suction capable of removing a corresponding amount of water, including:
   - *a.* a first hose, means at one end for coupling it to a source of clean water;
   - *b.* a second hose, resistant to collapse, means at one end for coupling it to the source of suction;
   - *c.* means for holding the two hoses in generally parallel relation throughout most of their length;
     - *a*(1) means on the discharge end of the first hose for causing the discharge to be expelled in jet form;
     - *b*(1) a fitting on the suction end of the second hose, adjacent the discharge of the first hose and opening at substantially right angles to the direction of jet discharge;
   - *d.* a thin, flat plate surrounding the suction fitting and extending at right angles to the suction opening;
     - *d*(1) rolling means on said plate to support the suction opening above a supporting surface; and
   - *e.* an hydraulic brake secured to the fitting to trail flexibly behind the discharge jet.

2. The invention according to claim 1 wherein the specific gravity of the pair of hoses is substantially that of water or slightly less.

3. The invention according to claim 1 wherein the two hoses are held together over most of their length by resilient bands spaced at intervals of 10 to 15 times the hose diameter.

4. The invention according to claim 1 wherein the hose length exceeds 200 times the hose diameter and includes a stiffening member applied along the hose about 75 to 150 hose diameters back from the jet discharge.

5. The invention according to claim 4 wherein the stiffener is more flexible in one dimension at right angles to the hose axis than a second dimension at right angles to both the first dimension and the axis of the hose.

6. The invention according to claim 1 wherein the hose length exceeds 200 times the hose diameter and includes a float secured to the hose about 75 to 150 hose diameters back from the jet discharge by a flexible linkage about 1 foot in length.

7. The invention according to claim 6 including flexible

means extendible to the pool edge from said linkage to move and secure the point of float suspension.

8. The invention according to claim 1 wherein the discharge means produces a generally flat, fan shaped jet.

9. The invention according to claim 1 wherein the fitting on the end of the suction hose is connected thereto by swivel means to be rotatable about the axis of the hose.

10. The invention according to claim 9 wherein the jet discharge extends outwardly beyond the fitting on the end of the suction hose.

11. The invention according to claim 1 wherein the plate surrounding the suction opening extends outwardly beyond the opening at least 3 times the diameter of the opening.

12. The invention according to claim 1 wherein the plate surrounding the suction opening is generally triangular in shape with one apex extending in the direction of the hose connections.

13. The invention according to claim 12 wherein the base edge portion of the plate is turned upwardly in the direction of the jet discharge.

14. The invention according to claim 1 wherein the rolling means are adjustable in height with respect to the supporting surface.

15. The invention according to claim 1 wherein the hydraulic brake is a hollow cone secured at its closed apex to a flexible member connected to the suction fitting.

16. The invention according to claim 15 wherein the hollow cone is made of buoyant material.

References Cited in the file of this patent

UNITED STATES PATENTS

2,332,940	Senke	Oct. 26, 1943
2,923,954	Babcock	Feb. 9, 1960
3,032,044	Pansini	May 1, 1962

FOREIGN PATENTS

584,029	Great Britain	Jan. 6, 1947