

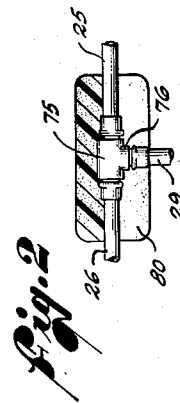
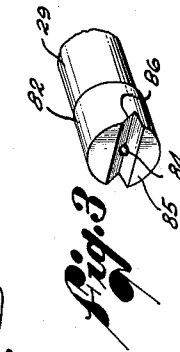
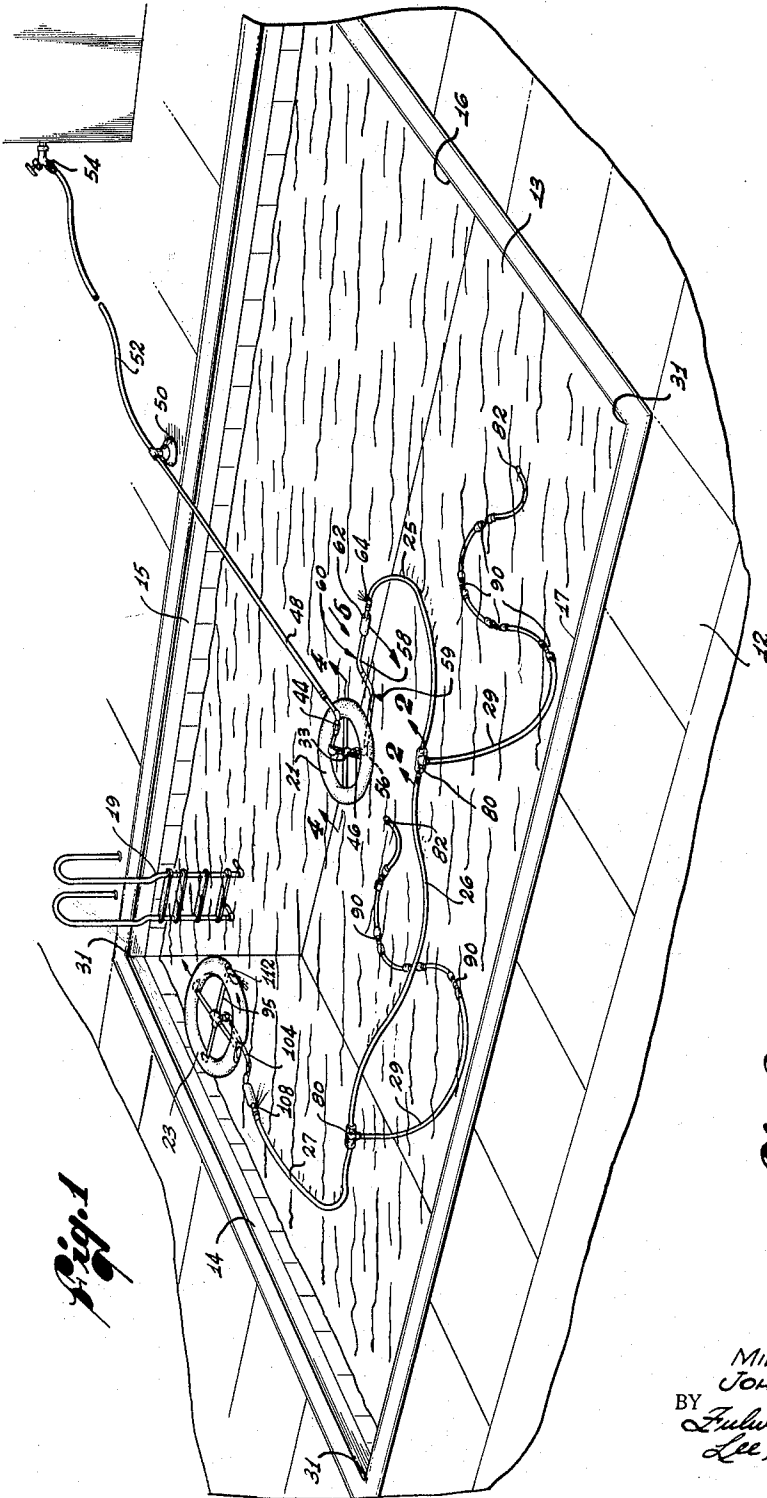
Feb. 23, 1965

M. D. WINSTON ETAL
SWIMMING POOL CLEANING AID

3,170,180

Filed Jan. 14, 1963

3 Sheets-Sheet 1



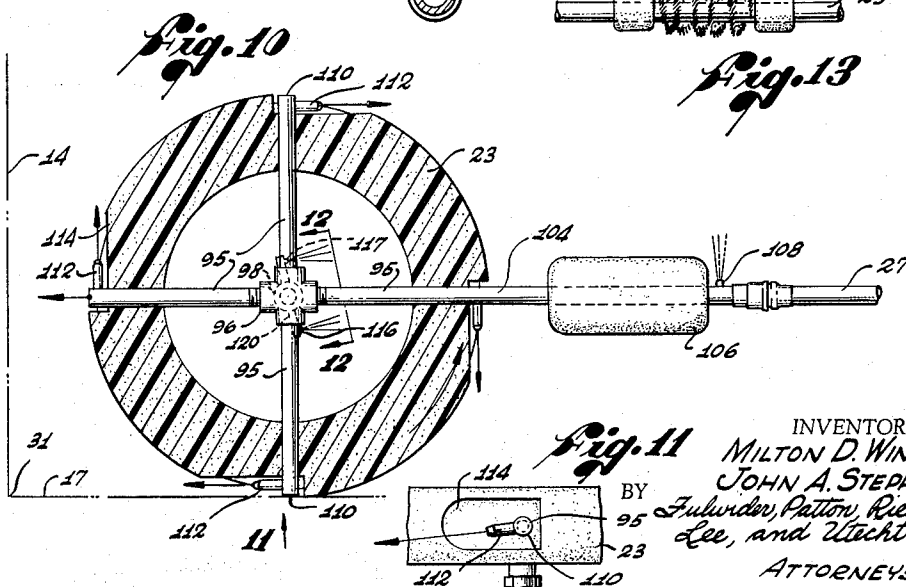
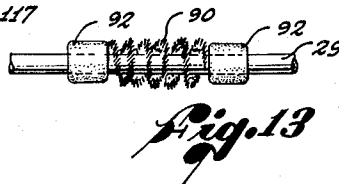
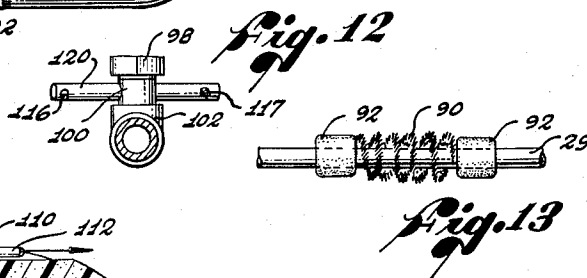
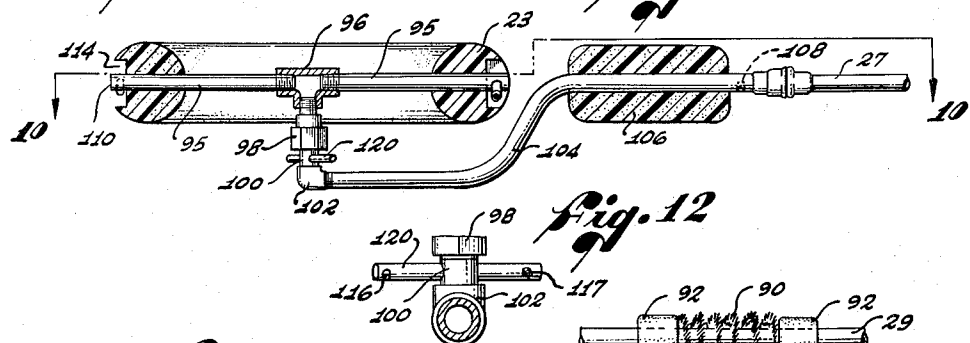
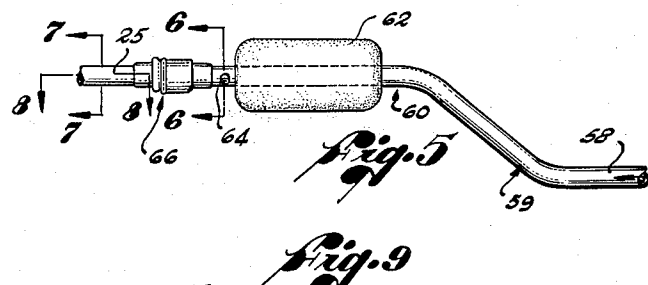
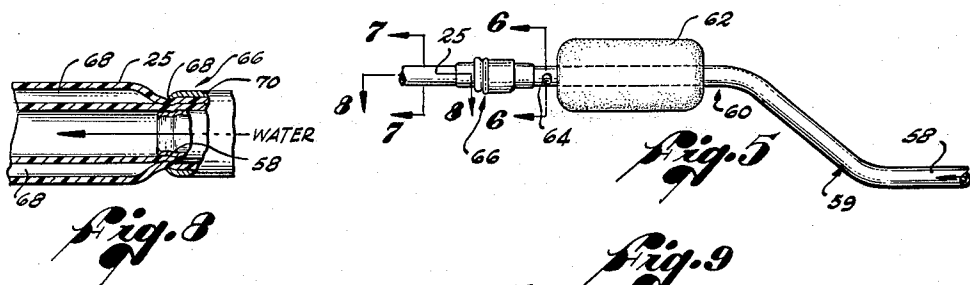
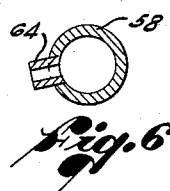
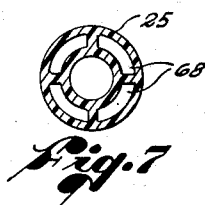
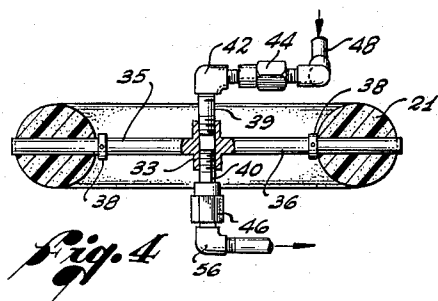
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3 Sheets-Sheet 2



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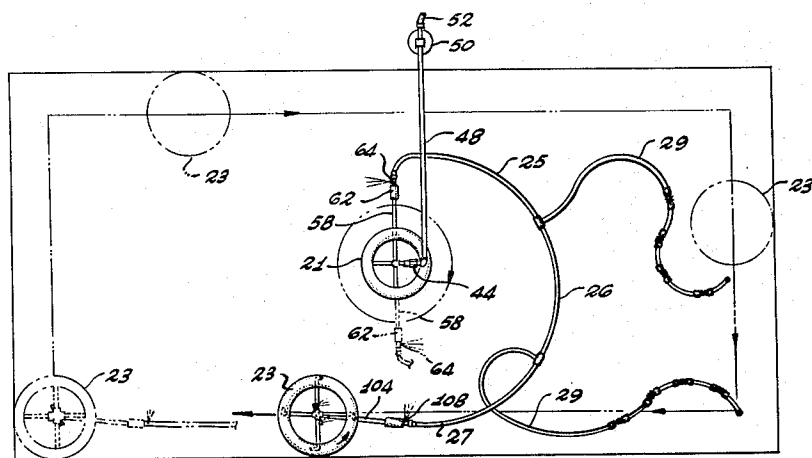


Fig. 14

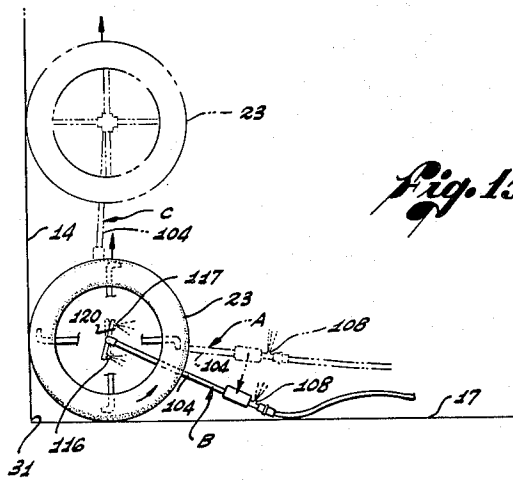


Fig. 15

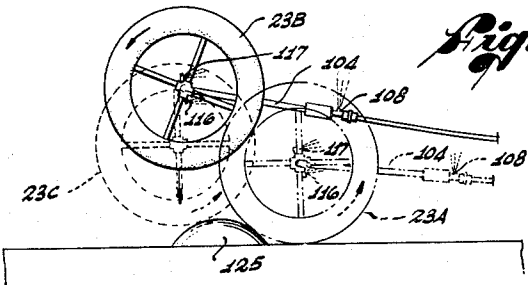


Fig. 16

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SWIMMING POOL CLEANING AID

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Filed Jan. 14, 1963, Ser. No. 251,098
18 Claims. (Cl. 15—1.7)

This invention relates generally to swimming pool maintenance devices, and more particularly to a new and improved swimming pool cleaning aid for automatically removing scum, sediment, and other accumulations of foreign matter from all submerged surfaces of a pool and dispersing such foreign matter into the pool water for subsequent removal by the normal action of a swimming pool filtering system.

The cleaning of sediment and other foreign matter from both the bottom and side walls of swimming pools involves considerable expense, since such cleaning is required at regular intervals and is both laborious and time consuming. This expense and work involved in pool maintenance has, in the past, proven considerably discouraging to prospective purchasers of pool installations. Hence, pool owners and builders have long recognized the need for pool cleaning aids to reduce the time, labor and expense of such pool maintenance.

In recent years, automatic cleaning aids for swimming pools have been developed in which accumulated scum and dirt are cleaned from the walls of a pool by the action of a high pressure water spray issuing from a discharge nozzle attached to the end of a flexible hose. The flexible hose is submerged in the pool water and is pendently supported by a float on the water surface. The passage of water under pressure through the flexible hose and discharge nozzle causes the hose to writhe with a sinuous motion and thereby constantly reposition the high pressure water spray adjacent different portions of the pool surface in the vicinity of the supporting float. Means are usually also provided for moving the float and thereby conveying the hose to different sections of the pool.

While automatic pool cleaning aids of the aforementioned type are basically sound in principle, such devices have not proven entirely satisfactory under all conditions. In this connection, experience has shown that the effective area of the pool covered by the writhing hose is rather critically dependent upon the guided movement of the hose supporting float from point to point about the inner periphery of the pool. Such problems take on even greater significance in extremely large pools, pools having rather deeply recessed contours, and those having relatively sharp corner bends. In such instances, the hose supporting float tends to follow a path which bypasses various sections of the pool, with the consequent result that the flexible hose will fail to clean those portions of the submerged surface area of the pool in the vicinity of the bypassed sections. These bypassed areas must be cleaned, however, and this can usually be done only by resorting to tedious manual methods.

Although attempts have been made to provide guiding mechanisms which would custom tailor the movement of the hose supporting float to pools of a given size and shape, such mechanisms have generally proven to be a compromise, at best, and are complex, expensive, rather inconvenient to install, and often require adjustment.

Additional difficulties encountered with such automatic pool cleaning aids have been the tendency for the guiding mechanism to jam or bind at corners or the like until manually released, the inability to circumvent various pool obstructions such as ladders and the like, and the

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tendency for floats jarred away from the pool periphery to remain away from the sides of the pool.

Accordingly, it is an object of the present invention to provide a new and improved swimming pool cleaning aid which overcomes the above and other disadvantages of the prior art.

Another object is to provide new and improved means for automatically removing accumulated foreign matter from all submerged pool surfaces and dispersing such foreign matter in the water for subsequent removal by a filtering system.

A further object of this invention is the provision of improved means for guiding portions of a pool cleaning aid accurately along the entire inner periphery of the pool, whereby bypassing of portions of the submerged surface area by the flexible hoses of the cleaning aid is substantially obviated.

Still another object is to provide a new and improved pool cleaning aid embodying flexible hose positioning means capable of maneuvering into and out of corners, bends, and deeply recessed contours in a pool.

Yet another object of the present invention is the provision of a new and improved swimming pool cleaning aid embodying positioning means with greater resistance to being jarred away from the sides of the pool and which, if dislodged, will automatically return to a position abutting the sides of the pool.

A still further object is to provide a new and improved swimming pool cleaning aid which is relatively simple to install, requires virtually no adjustment, and will automatically accommodate itself to pools of any size and shape.

The above and other objects and advantages of this invention will be better understood by reference to the following detailed description, when considered in connection with the accompanying drawings of an illustrative embodiment thereof, and wherein:

FIGURE 1 is a perspective view of a swimming pool containing the pool cleaning aid of this invention;

FIGURE 2 is a sectional view, taken along the line 2—2 in FIGURE 1, and illustrates the manner in which each submerged flexible hose is supported by a float;

FIGURE 3 is a perspective view of the discharge nozzle installed at the unsupported end of each submerged hose;

FIGURE 4 is a sectional view, taken along the line 4—4 of FIGURE 1, and illustrates the construction of the stationary float used with the cleaning aid of the present invention;

FIGURE 5 is a fragmentary elevational view, looking in the direction of the arrow 5 in FIGURE 1, and illustrates a portion of the means for preventing entanglement of the hoses;

FIGURE 6 is a sectional view, taken along the line 6—6 in FIGURE 5, and illustrates the angular orientation of the reaction nozzle installed in one of the conduits;

FIGURE 7 is a sectional view, taken along the line 7—7 in FIGURE 5, and illustrates the flotation chamber construction embodied by some of the conduits;

FIGURE 8 is a fragmentary sectional view, taken substantially along the line 8—8 in FIGURE 5, and illustrates the manner in which a conduit embodying flotation chambers may be coupled to a conduit which does not embody such chambers, without loss of air from the flotation chambers;

FIGURE 9 is an elevational view, portions being shown in section, of the guide float system which moves along the inner periphery of the pool;

FIGURE 10 is a plan view, partially in section and

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taken along the line 10—10 in FIGURE 9, and further illustrates the details of the guide float system;

FIGURE 11 is a fragmentary elevational view, looking in the direction of the arrow 11 in FIGURE 10, and shows the angular orientation of the reaction nozzles used for rotating the guide float;

FIGURE 12 is a fragmentary sectional view, taken along the line 12—12 in FIGURE 10, and illustrates the nozzle construction near the center of the guide float;

FIGURE 13 is a fragmentary view of a brush arrangement for use with the cleaning aid of the present invention;

FIGURE 14 schematically illustrates the path of the guide float system along the inner periphery of the pool and further illustrates the rotation of portions of the cleaning aid apparatus about the stationary float to prevent hose entanglement, successive positions of the cleaning aid components being shown in phantom;

FIGURE 15 is a plan view illustrating the manner in which the guide float system maneuvers at the corners of a pool, successive positions being illustrated in phantom; and

FIGURE 16 is a plan view illustrating the manner in which the guide float system automatically returns to the side of the pool subsequent to being dislodged therefrom.

Referring now to the drawings, and particularly to FIGURE 1 thereof, a pool cleaning aid in accordance with the invention is shown installed in a typical pool having a deck 12, bottom 13, and sides 14—17. A ladder 19 extends from the deck 12 along the side 15 and is typical of the obstructions encountered by the pool cleaning aid in moving along the inner periphery of the pool defined by the sides 14—17. Although the pool in FIGURE 1 is shown to have a rectangular configuration, this is by way of example only, and it is to be understood that the pool cleaning aid of the present invention may be used in pools of any size and shape.

Briefly, and in general terms, the improved cleaning aid of our invention includes a master or stationary float 21 which is buoyantly supported in a fixed position upon the surface of the water at or near the center of the pool. The master float 21 provides a hub, or central base of operation, about which the remaining portions of the cleaning aid apparatus continually rotate during the cleaning process. A guide float 23 abuts the side walls of the pool at the water surface and continually moves around the pool along the inner periphery.

A system of floating conduits 25—27, from which a plurality of submerged flexible hoses 29 extend, in pendent relation, to the bottom 13 of the pool, are connected between the stationary float 21 and the moving guide float 23. With this arrangement, the range of coverage of the hoses 29 effectively encompasses the entire submerged surface area of the pool, as the hose support system is continually rotated about the master float 21 at the center of the pool and is also conveyed to every nook and cranny at the sides of the pool by the guide float 23 moving along the inner periphery.

Means are also provided, in accordance with our invention, for insuring that the guide float 23 continually abuts the sides 14—17 of the pool, for enabling the guide float to turn itself at the corners 31 or any other contoured portion of the pool without jamming or binding, and to circumvent obstructions such as the ladder 19 during the cleaning operation and then return to its normal operating position against the side of the pool. In view of this automatic capability of the guide float 23 to hug the sides of the pool in its movement about the stationary float 21, it will be apparent that the pool cleaning aid of our invention can be adapted to pools of any size and shape by merely altering the total length of the conduits extending between the floats 21 and 23.

Referring now to FIGURES 1 and 4, the stationary float 21 essentially comprises a body of plastic foam or other buoyant material for supporting portions of the fluid supply system and providing a stable reference at the

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center of the pool for the rotating conduit system of the cleaning aid. Although the float 21 is shown as being toroidal in FIGURES 1 and 4, other float shapes may be used without in any way departing from the spirit and scope of the invention.

A hollow fitting 33 having a pair of diametrically opposed, outwardly extending rod-like arms 35, 36 is located at the center of the float 21. The arms 35, 36 extend into the float 21 through a pair of holes provided for that purpose. Each of the arms 35, 36 carries an adjustable collar 38, so that the arms can be shifted along their longitudinal axes to alter the relative position of the central fitting 33 with respect to the float 21.

The fitting 33 is provided with an internally threaded bore for receiving and coupling the ends of two relatively short and rigid fluid conduits 39, 40. The upper conduit 39 is connected through a right-angled elbow 42 to a fluid-tight swivel 44 having a horizontally disposed axis of rotation. The lower conduit 40 is connected to a similar swivel 46 having a vertically disposed axis of rotation.

The entire assembly of the float 21 and the hardware it supports is positioned at the center of the pool by a long, rigid conduit 48 having one end connected, through appropriate fittings, to the swivel 44, and having its opposite end supported by a mounting base 50 resting on the deck 12 of the pool. The end of the conduit 48 supported by the base plate 50 is connected to a fluid supply line 52, such as an ordinary garden hose, which is, in turn, connected to a high pressure water supply outlet 54.

By selecting a conduit 48 of proper length, or, alternatively, by using an extremely long conduit and moving the mounting base 50 closer or further away from the edge of the pool, the float 21 can be centered along one dimension of the pool, i.e., midway between the pool sides 15 and 17. Centering of the float 21 along the other dimension, i.e., midway between sides 14 and 16, is very simply accomplished by moving the mounting base 50 parallel to the side 15 to an appropriate position on the pool deck. Once the float 21 has been centered in this manner, no further adjustment of the pool cleaning aid is required.

The height of the conduit 48 above the surface of the water in the pool must be sufficient to provide clearance for the guide float 23 when the guide float passes under the conduit in moving along the sides of the pool. By virtue of the swivel 44, the connection between the conduit 48 and the fittings supported by the float 21 is unaffected by changes of water level in the pool, since the conduit 48 can pivot up or down about the swivel axis to compensate for alterations in float elevation.

Water under pressure passes through the conduit 48, enters the top of the fluid conduit system supported by the float 21, and exits through an elbow fitting 56 at the base of the float supported conduit system. From the elbow 56, the water is directed to the remaining portions of the conduit system embodied by the cleaning aid. Because of the vertical axis of the swivel 46, the remaining portions of the cleaning aid apparatus are able to rotate about the float 21 and still receive the necessary fluid supply.

Referring now to FIGURES 1 and 5, the fluid output from the elbow 56 below the stationary float 21 enters one end of a rigid conduit 58 which is bent at 59 and 60 so that the conduit inclines upwardly to the water surface from the submerged level of the elbow 56. A buoyant support means, such as a float 62 of foam plastic or the like, surrounds the upper portion of the conduit 58 in a collar-like fashion to maintain the upper portion of the conduit at the surface of the water.

A substantially horizontally extending discharge nozzle 64 projects from the upper end of the conduit 48 remote from the elbow 56. The reaction force of the jet stream issuing from the nozzle 64 provides a propulsive force for rotating the conduit 58, float 62, and remaining portions of the cleaning aid apparatus coupled thereto in a clock-

wise path about the swivel 46 and float 21 as seen in FIGURE 1. Rotation of the conduit system about the float 21 prevents kinking or entanglement of the various conduits when the other end of the conduit system is conveyed in a similar clockwise path by the guide float 23. As will be observed in FIGURE 6, the discharge nozzle 64 is directed slightly below the horizontal plane, so that the jet stream issuing from the nozzle will always impinge on the water surface, and thereby improve the propulsion efficiency of the nozzle.

The rigid conduit 58 is coupled at 66 to the flexible conduit 25 which floats upon the surface of the water. As will be apparent in FIGURES 7 and 8, the flexible conduit 25 includes a plurality of flotation chambers 68 along its length to render the conduit buoyant. As observed in FIGURE 8, the conduit 25 is coupled to the conduit 58 by inserting the conduit 58 into the central, fluid passage of the conduit 25 and then clenching the combined structure with an external collar 70, to secure the two conduits together and simultaneously seal off the flotation chambers 68 so that the air cannot be displaced by water leaking into the flotation chambers.

As best seen in FIGURES 1 and 2, the floating conduit 25 is connected to a similar floating conduit 26 which is, in turn, connected to a third floating conduit 27. Connection between the floating conduits is accomplished by way of a T-coupling 75, oriented as shown in FIGURE 2 to provide a downwardly extending coupling leg 76 to which one end of the submerged flexible hose 29 is connected. Each of the submerged hoses 29 is therefore supported in pendent relation to the floating conduits 25-27 and is of sufficient length to reach and lie upon the bottom 13 of the pool for all water levels. A float 80 surrounds each of the junctions between the floating conduits 25-27 and the submerged hoses 29 to buoyantly reinforce the floating conduits against being pulled down by the submerged hoses.

The remote end of each of the submerged hoses 29 is provided with a fluid discharge nozzle 82 having a central jet orifice 84 of small diameter. The end face 85 of the nozzle 82 is provided with a deep V-shaped groove 86 extending across the full width of the face and having an apex which intersects the axis of the orifice 84. The groove 86 spreads or "fans" the spray pattern of the discharge nozzle 84 in the direction of the groove axis, so that the field of coverage of the spray is enhanced during the cleaning operation. The reaction force due to the water escaping under pressure from each of the discharge nozzles 82 imparts a writhing, sinuous motion to the submerged flexible hoses 29 and causes the hoses to not only whip about the bottom 13 of the pool, but up adjacent sides of the pool as well.

As observed in FIGURES 1 and 13, each of the submerged hoses 29 carries a plurality of helical brush elements 90 wound around the hose 29 at a number of locations along the length of the hose, each brush element being held in position by a pair of spacing collars 92 of foam plastic or the like. The brush elements 90 provide spacers between the hoses 29 and the submerged surfaces of the pool, to reduce hose drag and hence minimize hose wear. The brushes 90 also provide an abrasive action to aid in dislodging foreign matter from the pool surfaces. The collars 92, by virtue of their buoyant characteristics, tend to reduce the effective mass of each of the hoses 29 and thus further reduce hose drag. However, the buoyant effect of the collars 92 is insufficient to cause the hoses 29 to float and thus serve only to reduce the load presented by the hoses to the reaction forces of the discharge nozzles 82.

The structure of the guide float system will be apparent from FIGURES 9-12. The guide float 23 is fabricated in the shape of a toroid or wheel and may be of any appropriate buoyant material, such as foam plastic or the like. The float 23 is provided with a plurality of radially extending holes for receipt of the ends of rigid fluid con-

duits 95 which intersect in a common fluid coupling 96 at the toroidal center of the float. The underside of the coupling 96 is connected to a swivel 98 similar to the swivel 46 in FIGURE 4 and also having a vertically disposed axis of rotation. The base of the swivel 98 is connected by a short conduit 100 and elbow 102 to a rigid fluid conduit 104 which extends to the water surface and is buoyed by a float 106 in the manner and configuration of the conduit 58 and float 62 in FIGURE 5. The provision of a substantially horizontally disposed discharge nozzle 108 at the end of the conduit 104 remote from the float 23, as well as the manner of coupling the rigid conduit 104 to the floating conduit 27 also essentially duplicates the corresponding structure in FIGURE 5.

Each of the radial conduits 95 is sealed off at its outer end 110 and is provided with a substantially horizontally extending discharge nozzle 112 at the side of the conduit. All of the nozzles 112 are directed to provide reactive propulsive forces, when water sprays from the nozzles, such that the nozzles 112, float 23, and radial conduits 95 will all rotate counterclockwise about the axis of the swivel 98, as seen in FIGURE 10. This rotary action of the float 23 aids in rolling the guide float along the side walls of the pool as the guide float system moves clockwise along the inner periphery of the pool in FIGURE 1.

A portion of the float 23 surrounding the outer end of each conduit 95 and nozzle 112 is removed to provide a clearance pocket 114 for these structures and to enable the jet stream from the nozzle to strike the water surface. In this connection, it will be observed in FIGURES 9 and 11 that the nozzles 112 are directed slightly below the horizontal plane to enhance propulsion efficiency in the same manner as the nozzle 64 in FIGURE 6.

Although rotation of the float 23 by the nozzles 112 has some tendency to propel the guide float system along the sides of the pool, the friction between the surface of the float 23 and the wet side walls is minimal. Therefore, propelling the guide float system by this means alone would normally prove too slow for most purposes. To increase the propulsive force for moving the guide float 23 along the pool sides, a pair of parallel, horizontally extending nozzles 116, 117 project from a common side, at opposite ends respectively, of a conduit 120 affixed to and in fluid communication with the conduit 100 below the swivel 98. By virtue of their location below the swivel 98, the nozzles 116, 117 do not rotate with the float 23, but rather direct a constant force component in the direction of translational movement of the guide float 23 along the pool sides.

The conduit 120 carrying discharge nozzles 116, 117 is angled slightly, as best observed in FIGURES 9 and 10, to provide a counterclockwise angle in the horizontal plane of slightly more than 90 degrees with the conduit 104. In this manner, the resultant propulsive force of the nozzles 116, 117 has a small force component directed inwardly towards the side of the pool, so that the float 23 has a tendency to hug the inner periphery of the pool and resist deflection away from the pool sides. In the absence of this angular orientation, as where the resultant force of the nozzles 116, 117 is parallel to the conduit 104, there is a tendency for the guide float system to wander away from the sides of the pool or be readily diverted by various pool obstructions.

Referring now to FIGURE 14, the over-all operation of the guide float system will be observed. As the float 23 moves along each of the side walls, it pulls conduit 104 and one end of the flexible conduit system with it to every portion of the pool, regardless of the pool shape. Hence, the submerged flexible hoses 29 have access to every part of the pool for purposes of dislodging foreign matter from the submerged surfaces.

As the guide float 23 moves in its clockwise path around the pool, the other end of the flexible conduit system secured to the rigid conduit 58 rotates clockwise

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about the stationary float 21, by virtue of the propulsive effect of the discharge nozzle 64. Hence, both ends of the flexible conduit system are rotated clockwise about the center of the pool, and there is substantially no tendency for the conduit system to kink or become entangled. As the float 23 moves along the sides of the pool, the conduit 104 trails behind the float and is very nearly parallel to the pool sides. This is due to the viscous shear forces which, when the conduit 104 is being pulled by the float 23, tend to override the inwardly directed reactive force of the nozzle 108.

The manner in which the guide float 23 maneuvers corners is best observed in FIGURE 15. When the guide float 23 initially makes contact with the side 14 at the corner 31, the conduit 104 is in its normal position A shown in phantom and nearly parallel to the side 17 of the pool. However, as soon as the float 23 ceases its translational movement and becomes lodged in the corner 31, the forces of viscous shear previously overriding the effects of the discharge nozzle 108 diminish, so that the reactive force at nozzle 108 rotates the conduit 104 towards the side 17 about an axis through the swivel 93 in FIGURES 9 and 10. Rotation of the conduit 104 to position B causes like rotation of the conduit 120, so that the propulsive forces of the nozzles 116, 117 are re-directed to provide a small force component parallel to the pool side 14. The latter causes the float 23 to gradually move out of the corner 31 and resume its normal translational motion along the inner periphery of the pool. As the float 23 moves away from the corner 31, the conduit 104 resumes a normal position C trailing behind the guide float parallel to pool side 14. Deeply recessed contours and sharp bends can be maneuvered by the guide float 23 in the same manner as illustrated for the corner 31 in FIGURE 15.

Referring now to FIGURE 16, the manner in which the guide float system automatically returns to the side of the pool after being dislodged therefrom, as by the obstruction 125, will be observed. Position 23A shows the guide float under normal conditions prior to being dislodged from the side of the pool. Position 23B represents the dislodged position of the guide float, and 23C represents a position of the guide float during its return to the side of the pool.

When the guide float system, including guide float 23 and conduit 104, is jarred away from the side of the pool, by any cause, the system will have a tendency to pivot about a vertical axis through the centroid or center of mass of the system. This centroid will lie along the conduit 104, closer to the guide float end of the conduit than the end carrying the discharge nozzle 108. Hence, in order for the guide float 23 to turn inwardly, towards the side of the pool, rather than being turned further away from the pool side, the sum of the moments about the centroid of the system must be counterclockwise. Since the discharge nozzle 108 will produce a rather large clockwise moment, this clockwise moment must be cancelled out by the counterclockwise moments about the centroid due to discharge nozzles 116, 117. However, discharge nozzle 116, by virtue of its orientation, will produce either an additional clockwise moment or an extremely small counterclockwise moment. Therefore, discharge nozzle 117 must provide virtually all of the counterclockwise moment necessary to balance out the clockwise moments acting on the system and the additional counterclockwise moment necessary to return the float 23 to the pool side. For this reason, and as best observed in FIGURE 12, the discharge nozzle 117 is made larger than the discharge nozzle 116 to satisfy the necessary moment requirements.

The swimming pool cleaning aid of the present invention satisfies a long-existing need for a relatively simple, yet automatic cleaning device which is efficient, requires virtually no skill to install, and is capable of use in pools of virtually any size and shape.

It will be apparent from the foregoing that, while a

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particular form of our invention has been illustrated and described, various modifications can be made without departing from the spirit and scope of our invention. Accordingly, we do not intend that our invention be limited, except as by the appended claims.

We claim:

1. A swimming pool cleaning aid comprising:
 - a first float for placement at a substantially stationary position within a pool;
 - a second float;
 - means for continually moving said second float along the side walls of said pool, and in constant contact therewith, in a single direction only about said first float;
 - and fluid conduit means coupled between said first and said second floats.
2. A swimming pool cleaning aid comprising:
 - a first float;
 - a second float;
 - flexible conduit means connected between said first and said second floats;
 - means for rotating one end of said flexible conduit means continuously in a single direction about said first float;
 - means for propelling said second float continuously along the inner periphery of said pool;
 - and a flexible, submersible hose having a discharge nozzle at one end thereof and having its opposite end coupled to said flexible conduit means in pendent relation thereto.
3. Automatic cleaning apparatus for use in a swimming pool having side walls and a bottom wall, said apparatus comprising:
 - a substantially stationary float;
 - a movable float;
 - flexible conduit means coupled between said stationary and said movable floats;
 - means for rotating one end of said flexible conduit means, in a single direction only, about said stationary float;
 - means for simultaneously biasing said movable float against the side walls of said pool and for propelling said movable float continuously about said stationary float while abutting said side walls;
 - and a plurality of flexible, submersible hoses, each hose having a discharge nozzle at one end thereof and having its opposite end supported in fluid communication with said flexible conduit means and in pendent relation thereto, each of said hoses being of sufficient length to engage the bottom wall of said pool regardless of the water level in said pool.
4. Automatic pool cleaning apparatus comprising:
 - a stationary float;
 - a movable float;
 - conduit means having first and second remote ends, said first end being coupled to said stationary float, said second end being coupled to said movable float;
 - first discharge nozzle means for continually rotating said first end of said conduit means in a single direction about said stationary float;
 - and second discharge nozzle means for moving said second end of said conduit means continuously about said stationary float in the same direction of rotation as said first end of said conduit means is moved by said first discharge nozzle means and to keep said movable float moving along and in contact with the side walls of a pool.
5. Apparatus as set forth in claim 4, wherein said second discharge nozzle means includes first and second nozzles for simultaneously biasing said movable float against the side walls of the pool while imparting movement to said float along said side walls, and a third nozzle for controlling the position of said first and second nozzles to enable said movable float to follow and maneuver contours in said side walls without jamming.

6. Automatic cleaning apparatus for use in a swimming pool having side walls and a bottom wall, said apparatus comprising:

a generally stationary float positioned substantially at the center of said pool;

a movable float;

flexible conduit means extending between and coupled to said stationary and said movable floats;

means to buoyantly support said flexible conduit means upon the surface of the water;

a plurality of elongated, flexible, submergible hoses, each hose having a discharge nozzle at one end thereof and having its opposite end supported in fluid communication with said flexible conduit means and in pendent relation thereto, each hose being of sufficient length to extend to the bottom wall of said pool;

first and second substantially parallel nozzles carried by said movable float for providing a resultant reactive force simultaneously biasing said movable float against the side walls of said pool and moving said float along said side walls, said second nozzle being larger than said first nozzle and being spaced further away from said side walls than said first nozzle as said float moves along said side walls;

and additional nozzle means communicating with said first and second nozzles through rigid conduit means, said additional nozzle means controlling the direction of said first and second nozzles, whereby said movable float can maneuver contours, corners and bends.

7. A swimming pool cleaning aid, comprising:

a generally stationary float adapted for positioning substantially at the center of a pool;

first rigid conduit means having first and second ends, the first end being rotatably supported by said stationary float;

an elongated, flexible conduit means having first and second remote ends, the first end of said flexible conduit means being coupled to the second end of said first rigid conduit means;

means for buoyantly supporting said flexible conduit means on the surface of the water;

a movable float adapted to follow the inner periphery of said pool;

second rigid conduit means having first and second ends, the first end being supported by said movable float, the second end being coupled to the second end of said flexible conduit means;

a plurality of elongated, flexible, submergible hoses, each having a discharge nozzle at one end thereof to cause said hose to writhe with a sinuous motion upon passage of fluid through said discharge nozzle, the other end of each hose being supported in fluid communication with said flexible conduit means and in pendent relation thereto, each hose being of sufficient length to reach the bottom of said pool at all water levels;

first discharge nozzle means at the second end of said first rigid conduit means to continually rotate said conduit means in a single direction about said stationary float;

second discharge nozzle means for imparting movement to said movable float along the sides of said pool while simultaneously biasing said float into abutment with said pool sides;

and third discharge nozzle means carried at the second end of said second rigid conduit means for altering the direction of said second discharge nozzle means in response to changes of contour in said pool sides.

8. A swimming pool cleaning aid as set forth in claim 7, wherein said second discharge nozzle means includes a pair of parallel nozzles of unequal size, said nozzles being coupled by a rigid conduit forming an angle

projected into a horizontal plane of greater than 90 degrees with said second rigid conduit means.

9. A swimming pool cleaning aid as set forth in claim 7, wherein each of the discharge nozzles at the ends of said flexible, submergible hoses includes means for spreading the water spray pattern as water is discharged through the nozzle.

10. A swimming pool cleaning aid as set forth in claim 7, wherein said movable float is toroidal in shape and is adapted to rotate about its own toroidal axis in moving along the sides of said pool.

11. Apparatus as set forth in claim 10, including a plurality of peripheral discharge nozzles carried by said toroidal float for rotating said float.

12. A swimming pool cleaning aid as set forth in claim 7, wherein each of said flexible, submergible hoses is provided with at least one helical brush wound about the hose.

13. Automatic cleaning apparatus for use in a swimming pool having side walls and a bottom wall, said apparatus comprising:

a stationary float for positioning at the center of a pool;

first rigid conduit means supported by said stationary float and having upper and lower ends;

an elongated, rigid fluid supply conduit extending from the pool deck to said stationary float;

a first swivel having a horizontal axis of rotation and coupling said fluid supply conduit to the upper end of said first rigid conduit means;

second rigid conduit means having first and second ends; a second swivel having a vertical axis of rotation and coupled to the lower end of said first rigid conduit means;

means for coupling the first end of said second rigid conduit means to said second swivel;

a plurality of flexible, floating conduits coupled together and having first and second remote ends, the first end of said flexible conduits being connected to the second end of said second rigid conduit means;

a toroidal, movable float adapted to simultaneously rotate about its own toroidal axis while moving along the inner periphery of said pool;

a plurality of substantially horizontally extending peripheral discharge nozzles carried by said toroidal float for rotating said float;

third rigid conduit means having first and second ends, the first end being connected to the second end of said flexible conduits;

a third swivel having a vertical axis, said third swivel being carried by said toroidal float;

means for coupling the second end of said third rigid conduit means to said third swivel;

a plurality of elongated, flexible, submergible hoses, each hose having a discharge nozzle at one end thereof for imparting a sinuous motion to the hose upon discharge of water through the nozzle, each hose being supported by said floating flexible conduits in fluid communication therewith and in pendent relation thereto, each hose being of sufficient length to extend to the bottom wall of said pool;

a first substantially horizontally extending nozzle at the second end of said second rigid conduit means for continuously rotating said conduit means in a single direction only about said stationary float;

a pair of parallel, substantially horizontally extending nozzles of unequal size joined by a rigid conduit;

means to rigidly couple said rigid conduit to said third rigid conduit means whereby said rigid conduit forms an angle projected into a horizontal plane in excess of 90 degrees with respect to said third rigid conduit means;

and substantially horizontally extending discharge nozzle means at the first end of said third rigid conduit means for controlling the position of said third

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rigid conduit means, whereby said pair of parallel nozzles may be directed to propel said toroidal float along side walls of any contour.

14. An automatic cleaning apparatus as set forth in claim 13, wherein said floating conduits include flotation chambers along their entire length. 5

15. Automatic cleaning apparatus as set forth in claim 13, wherein each of said flexible, submergible hoses carries a plurality of helical brush elements wound about said hose, each brush element being bounded at both ends by a pair of buoyant collars carried upon the hose. 10

16. In combination with a flexible, submergible hose: a helical brush wound about said hose and having its helical axis coaxial with the longitudinal axis of said hose;

and a pair of spacer collars of buoyant material carried upon said hose, one collar at each end of said brush.

17. In a swimming pool cleaning aid apparatus, the combination comprising:

a toroidal float; 20
means for rotating said toroidal float about its toroidal axis;

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first rigid conduit means having one end rotatably coupled to said float at the toroidal axis thereof; a pair of substantially parallel nozzles of unequal size; second rigid conduit means coupling said pair of nozzles to said first rigid conduit means and forming an angle projected into a horizontal plane in excess of 90 degrees with said first rigid conduit means; and nozzle means at the end of said first rigid conduit means opposite that rotatably coupled to said float for altering the direction of said first and said second rigid conduit means and said pair of nozzles.

18. A combination as set forth in claim 17, wherein said means for rotating said toroidal float about its toroidal axis includes a plurality of peripheral discharge nozzles carried by said float. 15

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