

[54] **POOL-CLEANING APPARATUS**

[76] Inventors: **Robert L. Koble, Jr.**, 4211 E. Desert Cove Rd., Phoenix, Ariz. 85028;
John M. Goettl, 1639 W. Indianola Ave., Phoenix, Ariz. 85015

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 53,468, July 9, 1970, abandoned.

[52] U.S. Cl. **134/167 R, 15/1.7, 210/169**

[51] Int. Cl. **B08b 9/08**

[58] Field of Search **15/1.7; 134/167 R, 168 R; 210/169**

[56] **References Cited**

UNITED STATES PATENTS

3,261,371	7/1966	Vernon	134/168 R
3,291,145	12/1966	Arneson	134/167 R
3,265,079	8/1966	Blumenfeld	134/167 R
3,348,686	10/1967	Spitzer	15/1.7

3,392,738 7/1968 Pansini..... 134/167 R

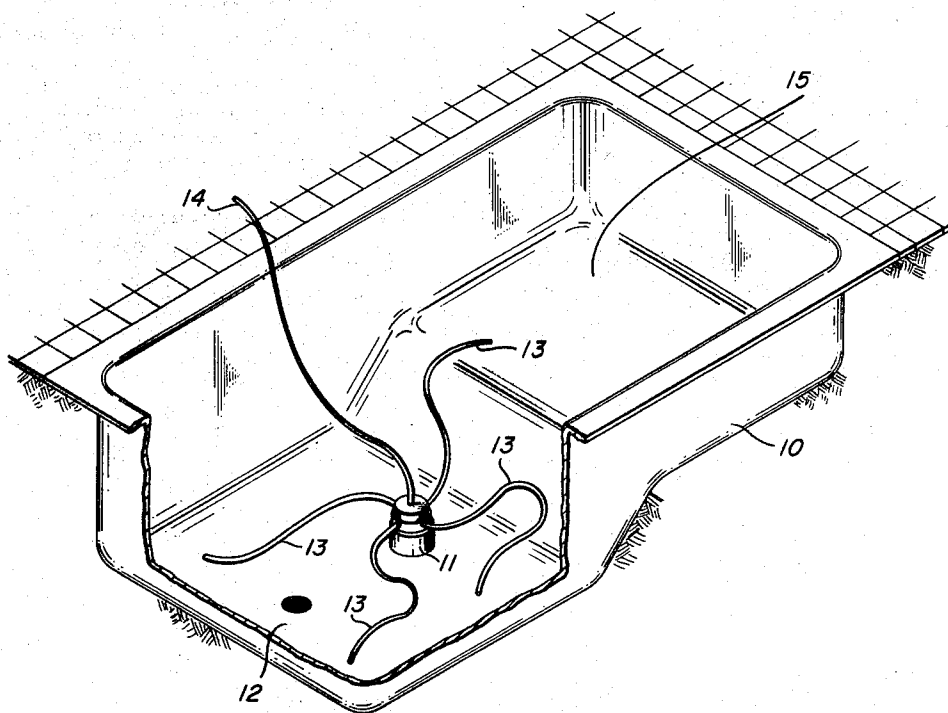
Primary Examiner—Edward L. Roberts

[57]

ABSTRACT

A swimming pool cleaning apparatus comprising a water distributor having a weight means for holding said water distributor on the bottom of a swimming pool; a passage means in said distributor for receiving water under pressure; a plurality of flexible substantially equally spaced apart pressure operated sinuously movable tubes communicating with said passage means and extending generally radially from said distributor and from the center of said weight means; a water supply tube extending upwardly generally concentrically above the center of said weight means and communicating with said passage means; said weight means having relative buoyant means thereabove; said apparatus usable relative to a method of the invention for collecting relatively heavy debris concentrically around said weight means and in close proximity thereto.

3 Claims, 9 Drawing Figures



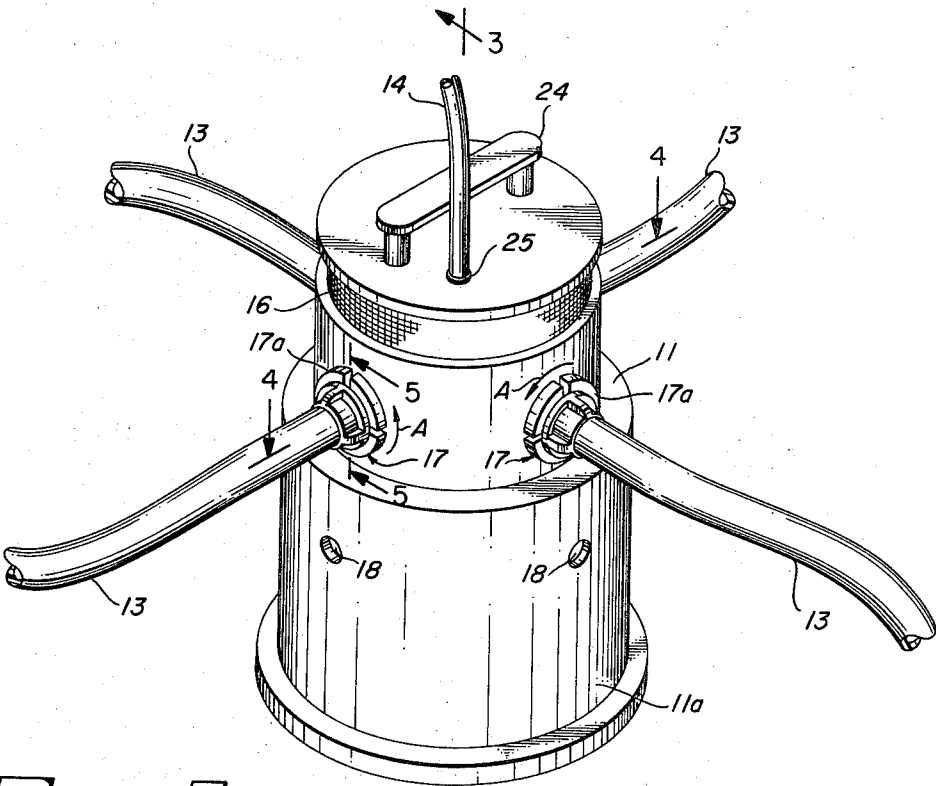


FIG. 2

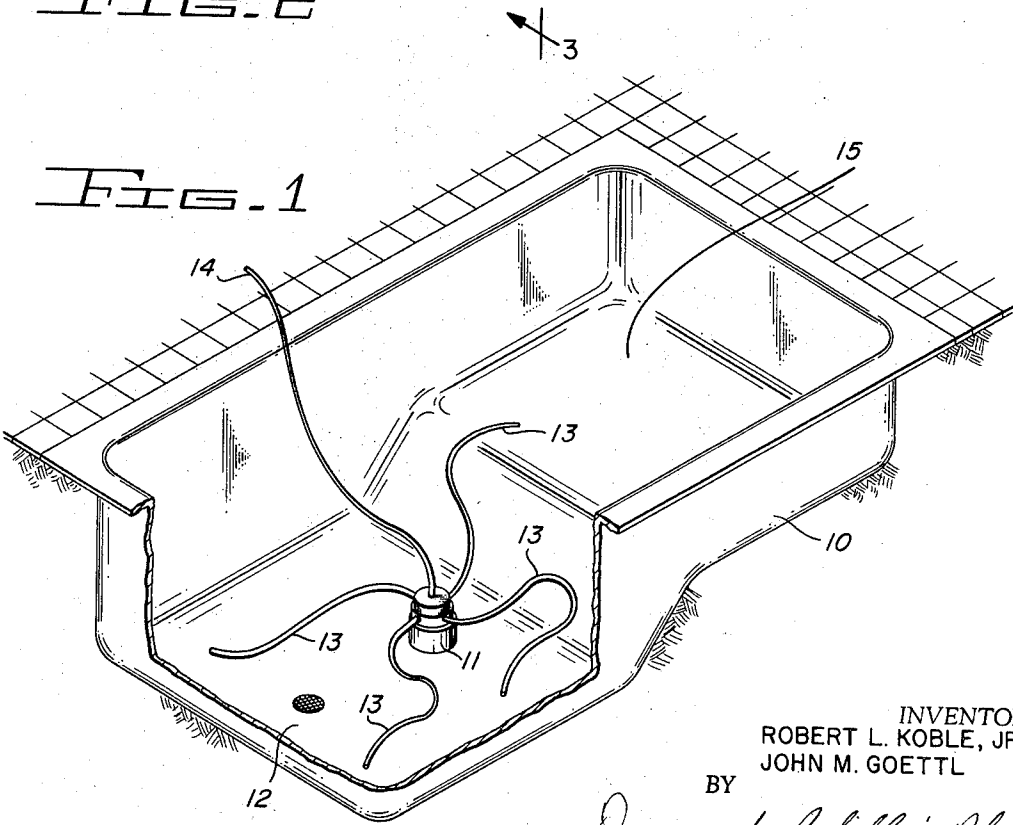


FIG. 1

INVENTORS
ROBERT L. KOBLE, JR.
JOHN M. GOETTL

BY

Drummond, Cahill & Phillips

ATTORNEYS

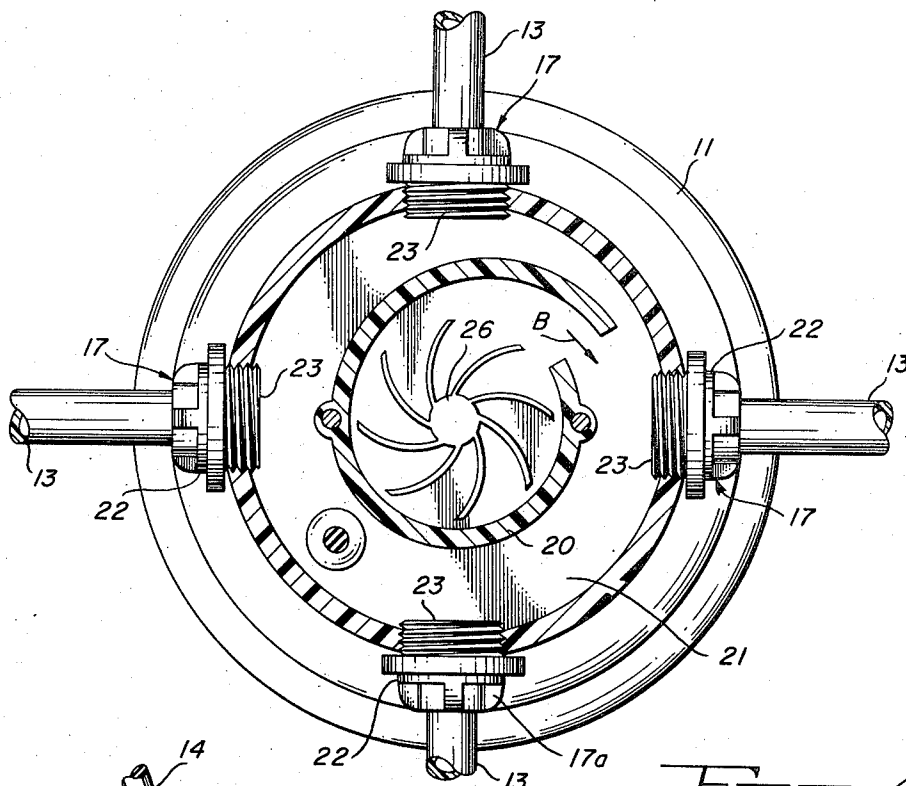


FIG. 4

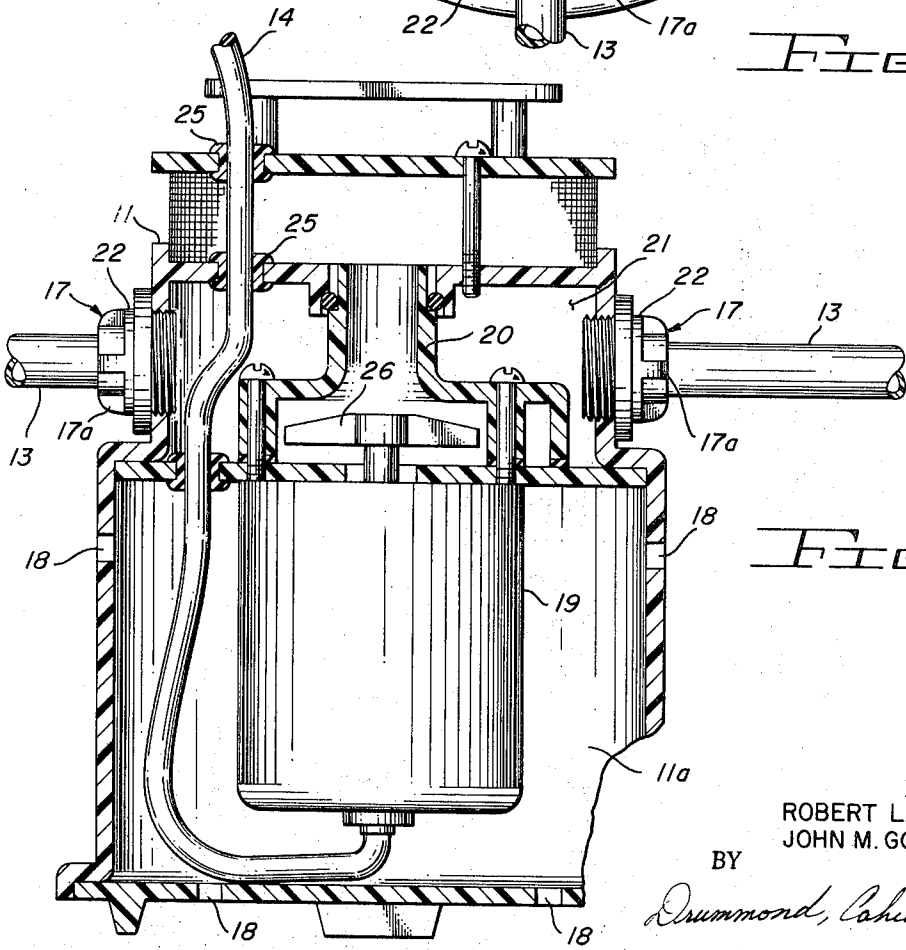


FIG. 3

INVENTORS
ROBERT L. KOBLE, JR.
JOHN M. GOETTL

BY
Drummond, Cahill & Phillips
ATTORNEYS

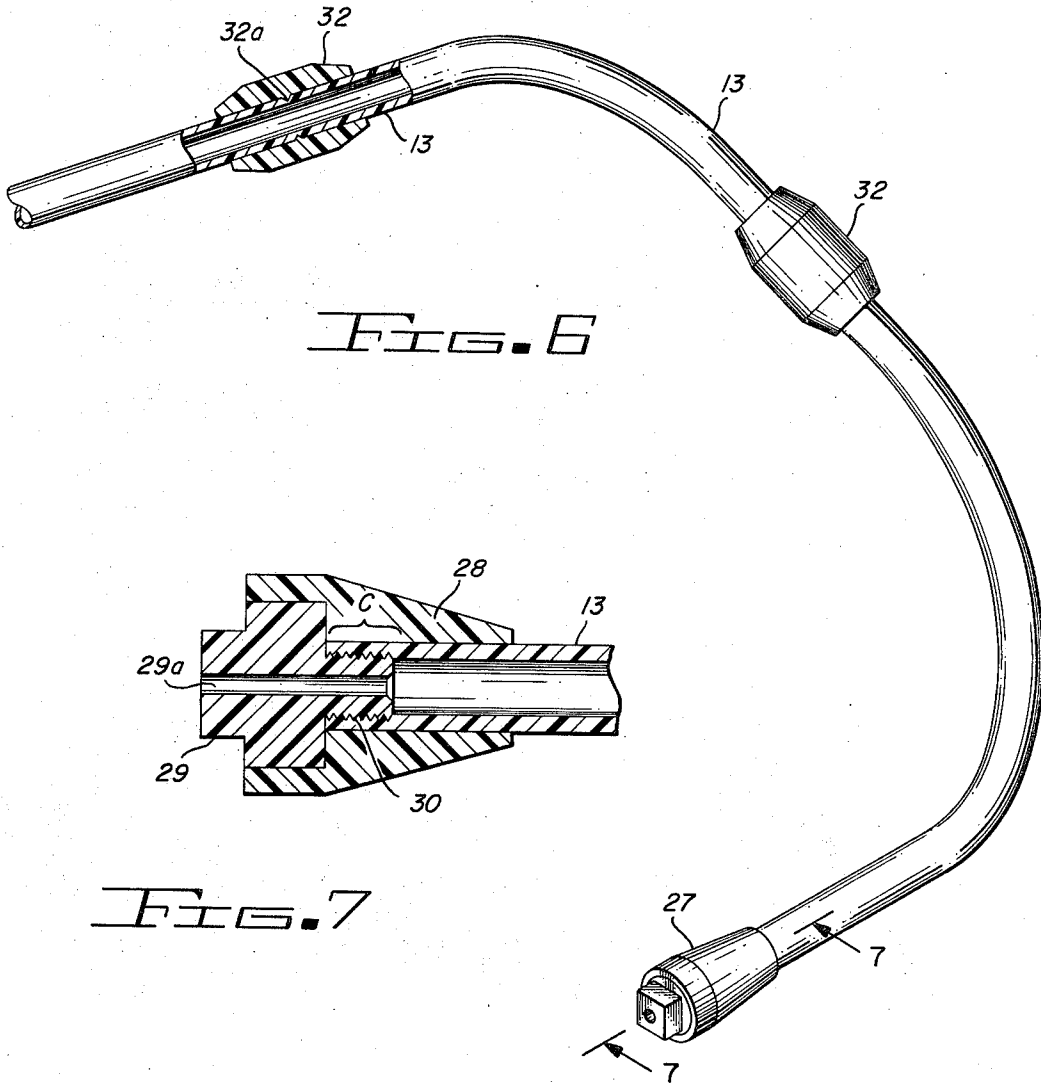


FIG. 6

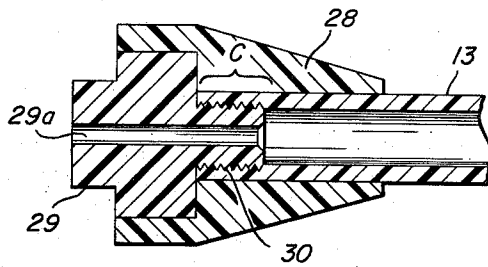


FIG. 7

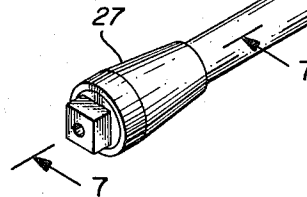
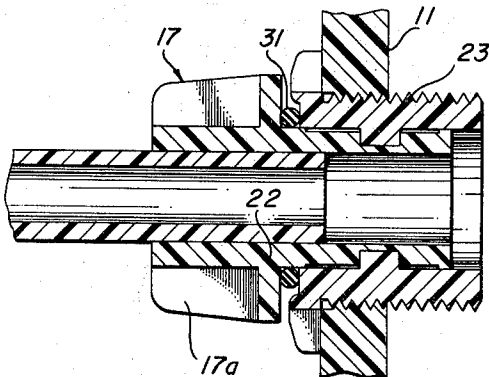


FIG. 5



INVENTORS
ROBERT L. KOBLE, JR.
JOHN M. GOETTL

BY

Drummond, Cahill & Phillips
ATTORNEYS

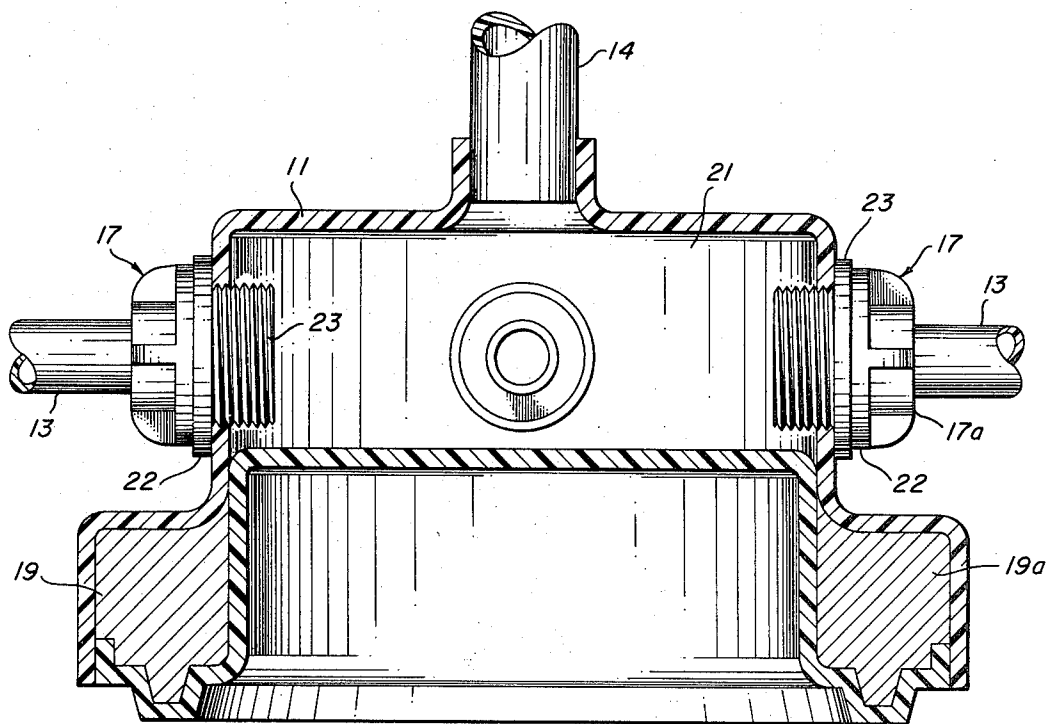


FIG. 8

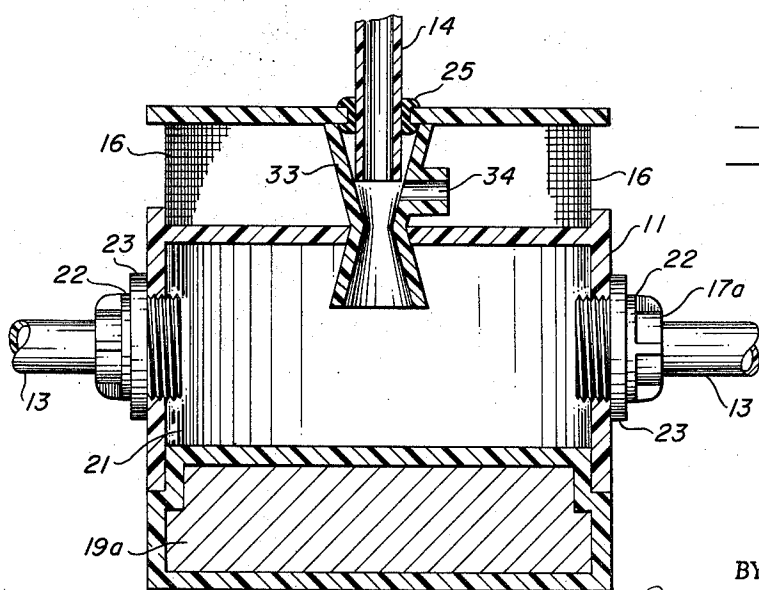


FIG. 9

INVENTORS
ROBERT L. KOBLE, JR.
JOHN M. GOETTL

BY

Drummond, Cahill & Phillips
ATTORNEYS

POOL-CLEANING APPARATUS

This patent application is a continuation in part of an application of Robert L. Koble, Jr., and John M. Goettl for Pool-Cleaning Apparatus, Ser. No. 53,468, filed July 9, 1970, and now abandoned.

BACKGROUND OF THE INVENTION

Various prior art pool cleaning apparatus is exemplified by the following U.S. Pats:

- J. B. Vernon — No. 3,261,371
- C. M. Blunenfeld — No. 3,265,079
- C. F. Spitzer — No. 3,348,686
- A. L. Pansini — No. 3,392,738
- H. N. Arneson — No. 3,291,145
- E. W. Ruston — No. 3,217,886

The foregoing prior art patents employ various devices for cleaning pools; however, none of them disclose a simple water distributor having a concentric assembly of generally radiating sinuously operated tubes disposed in close proximity to the bottom of the pool and held frictionally therein by a centrally disposed weight means.

Accordingly, all the structures disclosed in the foregoing patents are related generally to pool cleaning apparatus, however, such prior art apparatus does not comprise concentric radiating sinuous tubes extending from a central weight means such that heavy foreign matter may be collected concentrically around the weight means due to dynamic action and hydraulic turbulence surrounding a central area so that heavy debris may be collected in said central area, to facilitate the removal of said heavy material from the pool.

Furthermore, the prior art patents do not disclose a weight means disposed on the bottom of a pool and readily movable, together with concentric generally radially disposed sinuous tubes coupled thereto and substantially equally spaced apart so that various areas of a pool may be cleaned by generally concentric radiating sinuous tubes which create a generally circular pattern of dynamic turbulence in the pool.

SUMMARY OF THE INVENTION

The present invention comprises a swimming pool apparatus having a central weight means adapted movably to be positioned in frictional engagement on the bottom of a pool and the weight means carries a water distributor having a plurality of sinuously operated generally radially disposed flexible tubes equally spaced around the center of the weight means and a supply conduit communicates with the sinuous tubes and delivers water thereto under pressure. The generally concentric arrangement of flexible radiating tubes provides a generally circular pattern of dynamically turbulent water in the pool which suspends light foreign matter and causes movement of the relatively heavy foreign matter to a position closely surrounding the central weight means so that it may readily be collected in a small area upon movement of the central weight means as desired. The water delivery conduit extending to the weight means and communicating with the sinuous tubes extends generally upward from the center of the weight means to provide a direct suspension device convenient for lowering the weight means into the pool in an upright manner so as to permit placement of the weight means and the sinuous tubes in a pool in a desired location. The weight means may then slidably be moved on the bottom of the pool to various locations

as desired and many conveniently be moved by sliding the weight means together with the sinuous tubes by pushing it or pulling it with a conventional long handled pool brush or the like.

- 5 The invention also relates to a novel method wherein a plurality of flexible sinuously operable jet tubes extend generally in a radial direction away from a central weight means and wherein they are substantially equally spaced around the weight means so as to provide for the creation of a generally ring-shaped pattern of hydraulic turbulence which causes movement on the bottom and sides of the pool to dynamically suspend foreign matter in the water of the pool, and also to progressively cause a relatively non-turbulent area centrally around the weight means so as to force heavy articles from the relatively turbulent area to the relatively non-turbulent area and to collect the heavy foreign matter directly and in close proximity to and surrounding the central weight means which holds the sinuously operable tubes in various desired positions on the bottom of the pool. The weight means having sufficient weight frictionally to maintain the sinuously operable tubes in opposition to their jet reaction forces so as to hold the weight means in a stationary location as desired.

- 25 The invention also comprehends an elongated hose for use in connection with the above-described swimming pool cleaning apparatus and other swimming pool cleaning devices which rely upon the ejection of water under pressure in the vicinity of the inner surface of a swimming pool to maintain foreign particulate matter in suspension for removal by the normal pool-cleaning system. Such elongated hose is provided with wear-resistor elements located at spaced points along the hose to substantially prevent abrading contact between the hose and the inner surface of the swimming pool by spacing the hose from the inner surface. In a preferred embodiment, the wear-resistor elements comprise cylindrical members having greater resistance to abrasion by the inner surface than the material from which the elongated hose is formed. The wear-resistor elements are spaced along and engaged with the outer surface of the cleaning hose to prevent accidental dislocation from their respective spaced positions by means of internal detent ridges projecting inwardly from the inner surface of the elements to deform the hose to conform to detent ridges.

- 50 This invention relates to apparatus for cleaning swimming pools.

- 55 More particularly, the invention concerns swimming pool cleaning apparatus which includes a positionable water supply distributor from which water is supplied under pressure to one or more cleaning hoses which undergo sinuous movement in response to water forced under pressure therethrough, thereby maintaining particulate foreign matter in the swimming pool in suspension for removal by the normal pool water filtration system.

- 60 In another respect, the invention relates to a pool-cleaning device which is especially adapted for convenient placement into the pool during periods of non-use and which may be conveniently repositioned at various points along the inner surfaces of the pool and which may yet be quickly and conveniently removed from the pool during periods of normal use.

- 65 In still another aspect, the invention concerns a pool-cleaning device of the type which maintains foreign

particulate matter in suspension by means of water forced through one or more sinuously moving hoses, in which the hoses are readily and conveniently detachable from the pool-cleaning device for storage and/or replacement.

In yet another aspect, the invention relates to an improved hose for use in connection with the herein described apparatus or other pool-cleaning devices which employ cleaning hoses, which improved hose is especially adapted for convenient attachment and removal from the pool-cleaning device and which is provided with specially constructed wear-resistor elements which increase the operating life of the cleaning hose by preventing abrading contact between the hose and the inner surface of the pool.

In recent years, many attempts have been made to provide pool-cleaning devices which function to cause foreign particulate matter in the swimming pool to be suspended in the pool water for removal by the conventional pool water filtration system.

The conventional pool water filtration system typically and normally includes a conduit for removing water from the pool and conducting the removed water to the suction of a pump. The pump then forces the removed water under pressure through a filter which may, for example, be a cloth filter covered with an appropriate filter-aid material such as diatomaceous earth or, again illustratively, the filter may be a so-called sand filter which removes foreign particulate matter by filtration through a bed of finely divided sand or other insoluble particulate matter. Such conventional apparatus usually and typically also includes means for back-flushing the filter system to eject the removed foreign particulate matter and clean the filtration medium.

According to common prior art practice, it is necessary to periodically brush the inner surface of the pool to dislodge foreign particulate matter which has become encrusted upon the pool inner surfaces, then to wait for a period of time until the dislodged encrustations again settle upon the pool surfaces and then to remove such particulate matter by means of a vacuum cleaner similar to a common household vacuum cleaner except that water is employed as the suspending medium rather than air.

The prior art devices which attempt to maintain the foreign particulate matter in suspension by means other than the conventional brushing technique are, in general, fairly complicated from a mechanical standpoint and, therefore, subject to frequent malfunctions. In the case of those prior devices which are more simply constructed to avoid mechanical malfunctions, it is generally necessary to install such systems at the time the pool is constructed or, alternatively, if such prior art systems are installed in an existing pool structure, they must either be left in operative position during the use of the pool. However, if they are to be removed, the task of removing, storing and replacing the pool-cleaning system is complicated, time-consuming and burdensome.

Particularly in those instances where pool-cleaning systems employing scouring or cleaning hoses are installed in existing pools, it is frequently difficult to attain proper cleaning action because many such pools are irregularly shaped and require a plurality of such cleaning units in order to effectively maintain substantially all of the particulate matter in suspension.

Accordingly, it would be highly desirable to provide a simply constructed, yet highly efficient pool-cleaning unit which is conveniently positionable at various points in the swimming pool such that the cleaning hoses will effectively reach all portions of the pool even though it may be irregularly shaped.

It is therefore an object of the present invention to provide an improved pool water-cleaning system.

Another object of the invention is to provide a novel pool-cleaning apparatus having a central weight means adapted frictionally to rest on the bottom of a swimming pool together with a plurality of substantially equally spaced generally radiating flexible sinuously operable tubes extending therefrom for creating a generally circular pattern of dynamically turbulent water in the pool, which tends to force heavy non-suspendable objects into close proximity with and surrounding the central weight means, in order to afford convenience in removing these heavy particles from a small area of the pool.

Another object of the invention is to provide a novel central weight means having a plurality of generally radially disposed equally spaced apart sinuously operable tubes and a water supply conduit communicating therewith; said water supply conduit extending generally vertically above the center of the weight means to provide for convenience in suspendingly inserting the weight means and the sinuous tubes into the pool in an upright position and to avoid tangling of the sinuous tubes with the water supply conduit when in operation.

Another object of the invention is to provide a novel method for cleaning swimming pools comprising the construction and use of a plurality of radially disposed sinuous tubes for creating a generally circular ring-shaped pattern of turbulent water in a swimming pool in order to force heavy foreign matter which is non-suspendable into an area in close proximity and concentric with the central weight means which frictionally holds the sinuous tubes in a fixed location on the bottom of a swimming pool.

Another object of the invention is to provide a pool water-cleaning system which is of simplified, rugged construction and which may be easily and conveniently moved from one portion of the pool to another in order to secure substantially complete cleaning of the pool with a single unit.

Still another object of the invention is to provide a pool water-cleaning system which is operated either by the fluid under pressure provided by the normal pool-cleaning pump, by a comparatively low-powered electric motor driving an auxiliary pump, or by any other suitable source of water under pressure such as, for example, a conventional household water system.

It is still another object of the invention to provide pool-cleaning hoses for use in connection with the above-described apparatus or for use in connection with other apparatus which employ elongated scouring or cleaning hoses, which improved elongated hoses are provided with specially constructed wear-resistor elements which substantially prevent abrading contact between the hose and the inner pool surface, thereby increasing the operating life of the hose.

In yet another respect, the invention relates to such elongated hoses which are conveniently and quickly detachable from the pool-cleaning device such that dis-

assembly, storage and reassembly of the elements of the pool-cleaning device is facilitated.

These and other, further and more specific objects and advantages of the invention will become apparent to those skilled in the art from the following detailed description thereof taken in conjunction with the drawings, in which:

FIG. 1 is a partially sectional perspective view of a swimming pool containing a cleaning device embodying the present invention;

FIG. 2 is a perspective view of the pool-cleaning device located in the pool as illustrated in FIG. 1;

FIG. 3 is a sectional view of the device of FIG. 2 taken along section line 3—3 thereof, in which the means for supplying water under pressure to the cleaning hoses can be either a water-powered turbine or an electric motor;

FIG. 4 is a sectional view of the device of FIG. 2 taken along section line 4—4 thereof;

FIG. 5 is a sectional view illustrating the method of attachment of the cleaning hoses taken along section line 5—5 of FIG. 2;

FIG. 6 is a partial sectional perspective view of one of the cleaning hoses of the device of FIGS. 1—5;

FIG. 7 is a sectional view of the water-discharge orifice of the hose of FIG. 6 taken along section line 7—7 thereof;

FIG. 8 is a sectional view of another embodiment of the invention in which water under pressure is supplied to the water supply chamber by means of a conduit communicating with either the normal pool water filtration system pump or an auxiliary pump; and

FIG. 9 is a sectional view of yet another embodiment of the invention in which a small volume of water under high pressure is injected into the upstream end of a venturi which, in turn, withdraws water from the pool in the immediate vicinity of the water supply chamber for supplying sufficient water under pressure to activate the pool-cleaning hoses such as are exemplified in FIGS. 1 and 5-7.

The pool-cleaning unit comprehended by the present invention is one which is of such simple, yet rugged, construction that the owner of the pool can move it easily from one position within the pool to another position without substantial danger of damage to the mechanism and without even the necessity of entering the pool to change the location of the device.

Furthermore, in accordance with the preferred embodiments of the invention, the device is operated either by the water discharged from the pump of a normal pool-filtration system or may be operated by a low-powered electric motor driving an auxiliary pump, thus insuring economy of operation as well as simplicity.

Briefly, in accordance with the invention, a water-cleaning system is provided for use in a swimming pool having an inner surface and having a pool water-filtration system. The typical pool water-filtration system includes a water circulation system consisting of a pump for withdrawing water from the pool and supplying the withdrawn water under pressure to a filter. The filter removes suspended particulate matter from the water and means are provided for returning the filtered water to the pool. The present invention consists in the combination of a positionable water supply distributor shaped and adapted to be positioned at spaced points adjacent the inner surfaces of the swimming pool and includes a buoyant chamber located in the upper por-

tion of the water supply distributor and sufficient weight located below the buoyant chamber such that the weight located below the buoyant chamber, acting in combination with the buoyant chamber, operates to automatically position the water supply distributor in operative upright position adjacent the inner surface of the pool. Means are provided for supplying water under pressure within the water supply distributor and at least one elongated hose is provided for conducting water under pressure from the water supply chamber to various points spaced in the swimming pool remote from the location of the water supply chamber. By means of the sinuous movement of the elongated hose in response to water forced therethrough under pressure from the water supply distributor, fluid ejected from the end of the elongated hose causes foreign particulate matter in the pool water to be and remain in suspension for removal by the normal pool water-filtration system.

In one preferred embodiment of the invention, the means for supplying water under pressure to the water supply distributor includes an electrically driven pump positioned in the lower portion of the water supply chamber having an inlet for withdrawing water from the pool in the immediate vicinity of the supply chamber and pump outlet means for supplying water under pressure to the elongated hose.

In another embodiment of the invention, water is conducted under pressure to the water supply chamber by means of a conduit communicating between the conventional pool water-filtration system pump and the water supply distributor.

In still another embodiment, a high-pressure, low-volume stream of water from any suitable source is supplied by means of a conduit to a venturi carried in the water supply chamber, the venturi being provided with a water inlet aperture located at the throat of the venturi, and means are provided communicating between the water inlet aperture and the pool water in the immediate vicinity of the water supply distributor.

In still another respect, the invention comprehends an elongated hose for use in connection with the above-described apparatus, or for that matter, any other apparatus employing one or more hoses to conduct water under pressure to various points in a swimming pool for the purpose of suspending foreign particulate matter and retaining such matter in suspension for removal by the normal pool-cleaning system.

Briefly, according to such further embodiment of the invention, an elongated hose is provided for conducting water under pressure from a source of water under pressure to points in a swimming pool remote from the location of the source of water under pressure. According to this embodiment, the elongated hose includes one or more wear-resistor elements located at preselected spaced points along the hose in such manner as to substantially prevent abrading contact between the hose and the inner surface of the swimming pool by spacing the hose from the inner surface. Preferably, the wear-resistor elements comprise cylindrical members engaged by means of detent ridges projecting inwardly from the inner surface of the wear-resistor elements, the detent ridge being shaped to deform the outer surface of the hose to conform to the detent ridge to prevent accidental dislocation of the wear-resistor elements from their preselected spaced points along the hose. For best results, the wear-resistor elements

should be formed of material having greater resistance to abrasion by the inner surface than the material from which the elongated hose is formed.

Turning now to the drawings, in which the same reference numerals identify like elements in the several views, various embodiments of the invention are depicted for the purpose of illustrating to persons skilled in the art how to practice the invention and depicting the preferred embodiments of the invention. FIG. 1 illustrates a swimming pool structure, generally indicated by the referenced character 10, containing a water-cleaning system embodying the present invention, including the positionable water supply distributor 11 resting upon the inner surface 12 of the pool structure 10, and which generally shows a preferred embodiment which includes four flexible elongated hoses or jet reactive tubes 13 which conduct water under pressure from the water supply distributor 11 and, by means of the sinuous movement thereof induced by the flow of water therethrough under pressure, substantially continuously eject streams of water from the ends thereof to maintain foreign particulate matter in suspension. Means 14 are provided which may constitute, as will be explained below, either a water supply conduit or an electrical power supply cord connected to the water supply distributor 11 in such a manner as to enable the entire water supply distributor 11 and associated flexible jet reactive hoses or tubes 13 to be moved to another location on the inner surface of the pool, for example, as generally indicated by the reference character 15, such that the cleaning hoses will sweep in a sinuous pattern to suspend in the pool water any foreign particulate matter in that general portion of the pool structure 10. The bottom of the distributor 11 constitutes a supporting surface means frictionally engageable with the bottom of a swimming pool, and the weight of the distributor 11 is of sufficient magnitude to resist movement thereof by jet reaction forces imposed thereon by the hoses or jet reactive tubes 13.

With reference to FIG. 1 of the drawings, it will be seen that the distributor 11 comprises a central weight means adapted frictionally to hold apparatus of the invention frictionally engaged with the bottom of a swimming pool and this weight is sufficient to resist jet reaction forces of the flexible sinuous tubes 13 when they are operable with water under pressure therein. The water supply conduit 14 delivers water under pressure essentially in communication with the flexible sinuous tubes 13 and this water supply conduit 12 extends generally vertically upward in substantially vertical alignment with the center of the weight means 11. Thus the conduit 12 may be used suspendingly to place the weight means 11 in upright position in the pool and due to the vertical disposition of the conduit 14 it does not interfere with the operation of the sinuous tubes 13, and therefore avoids tangling of the tubes 13 with the conduit 14 when they are in operable position.

In accordance with the method of the invention, the sinuous tubes 13 are generally radially extended away from the center of the weight means 11 and are generally equally spaced therearound so as to cause dynamic hydraulic turbulence in the pool in a generally ring-shaped pattern surrounding the center of the weight means 11. This action causes suspension of the fine material in the water and this fine material is carried through the conventional swimming pool filtering system and the force of the dynamic turbulence in a ring-

shaped pattern causes heavy particules of foreign matter to be forced into an area close to and surrounding the central weight means 11. Accordingly, heavy matter which cannot be suspended in the water will be forced into a small area surrounding the weight means 11 and thereby concentrating the heavy particles in a small area which may readily and easily be cleaned when the weight means 11 is moved to another area on the bottom of the swimming pool 10.

FIG. 2 illustrates in more detail a perspective view of the water supply distributor 11 of FIG. 1 which may be provided, as will be hereinafter explained, with either a water turbine-driven pump or an electric motor. In either case, the source of motive power is supplied through the water or electrical conduit 14. In operation, water is drawn into the water supply distributor 11 through an annular screen 16 located in the upper portion of the device, which water is then pressurized and ejected through the cleaning hoses 13. The cleaning hoses are provided at their inner ends with quick disconnect fittings 17 such that the hoses 13 may be readily disengaged from the supply distributor 11 by rotational pressure exerted on the lugs 17a in the direction of the arrows A to disengage the male portion 22 from the female gland portion 23, the male portion 22 and female portion 23 constituting, for example, a familiar quarter-turn disconnect assembly.

The lower portion 11a of the water supply distributor 11 is provided with a plurality of apertures 18 such that the lower portion 11a of the distributor 11 will relatively rapidly be filled with water as the unit is lowered into the pool. However, until the water turbine pump or electrically driven pump 19 located in the lower portion 11a of the supply distributor 11 is energized, the upper portion of the water supply distributor 11, including the impeller house 20, the discharge plenum 21 and the hoses 13, remains substantially free of water, forming a buoyant chamber.

It will be observed by those skilled in the art that the weight of the motor 19, or, alternatively, specially provided weight members 19a, such as, for example, lead shot or cast lead, located generally below the distributor 11, acting in combination with the buoyant chamber portion above-described, will result in automatically positioning the entire unit in the proper operative upright position upon the inner surface of the pool as the unit is lowered into the pool. The water supply distributor may optionally be provided with a handle member 24 in order that the unit can be positioned manually, but in a preferred mode of operation the entire unit is merely lowered into the pool by means of the water delivery or electrical conduit 14 which is connected into the supply distributor 11 by means of grommets 25 or other connection of suitable strength such that the entire unit may be initially positioned in the pool structure 10 and moved from place to place therein by means of manipulating the water or electrical conduit 14 from ground level alongside the pool structure 10.

In the preferred embodiments illustrated in FIGS. 1-4, the water turbine or electrical motor 19 rotates the impeller 26 of a centrifugal pump provided with a volute-shaped casing 20 to discharge water under pressure in the direction of the arrow B into the hose supply plenum 21 from which the water is discharged through the hoses 13 to the outer ends 27 thereof which are preferably provided with a fitting more particularly de-

picted in FIG. 7. The fitting of FIG. 7 consists of an annular female member 28 which frictionally engages the outer walls of the hose 13. A male member 29 provided with threads 30 is inserted into the interior of the hose member 13 and deforms the walls thereof in the portion generally indicated by the reference character C to threadably engage the inside diameter of the hose 13 to force the outer surface into frictional engagement with the female member 28. The male member 29 is provided with an orifice 29a of restricted diameter which results in the water being ejected from the hose 13 at a greater velocity, thereby improving the efficiency with which the water thus ejected causes foreign particulate matter to be washed from the sides of the pool structure 10 and maintained in suspension for removal by the normal pool filtration system.

As shown in FIG. 5, an O-ring seal member 31 is positioned between the male member 22 and the female member 23 of the quarter-turn quick-disconnect fitting in order to insure that all water discharged from the plenum 21 is directed through the hoses 13 and automatically ejected from the end 27 thereof.

In a further preferred embodiment of the invention, wear-resistor elements 32 are provided in order to reduce the likelihood of abrading contact between the hose members 13 and the inner surfaces of the pool structure 10. In a preferred embodiment, the wear resistor elements 32 comprise cylindrically shaped members formed of a material having a greater resistance to abrasion by the inner surface of the pool structure 10 than the elongated hose. This allows one to select a hose material having a resiliency and flexural characteristics which will improve the mobility of the hoses and the nature of the sinuous movement thereof in response to the flow of water under pressure there-through, while simultaneously improving the operating lift of the hose by means of the wear-resistor elements 32 which tend to space the hose portion 13 away from, and prevent abrading contact between, the hose and the inner sides of the pool 10. For example, in a preferred embodiment of the invention, the hose members 13 are formed of 0.045 inch wall thickness, 7/16 inch outside diameter polyvinylchloride plastic.

When the above-described material is used to form the hoses, the wear-resistor elements are preferably formed of ABS plastic.

FIGS. 8 and 9 represent additional embodiments of the invention in which the water under pressure is furnished to the plenum 21 by means other than the water-turbine or electric motor-powered pump of FIGS. 3 and 4. As shown in FIG. 8, the water may be simply supplied through the conduit 14 connected to the discharge of a pump of suitable capacity having an inlet withdrawing water from the pool or from an auxiliary water source. Water entering through the conduit 14 into the plenum 21 is then ejected through the hoses 13 and the unit functions in the manner described above in connection with the description of FIGS. 1-4. Similarly, if it is desired to employ a source of water at high-pressure, but at low-volume, the water may be supplied through the conduit 14 into the upstream end of a venturi 33 provided with a water inlet aperture 34 located at the throat of the venturi 33. Discharge of the low-volume, high-pressure water supply through the conduit 14 into the upstream end of the venturi 33 results in water being sucked into the aperture 34 through the screen 16 from the area immediately adjacent the pool-

cleaning system and water at a lower pressure but at sufficient volume supplied to the plenum 31 and thence to the cleaning hoses 13.

The exact source of water under pressure which can be employed in connection with the embodiments of FIGS. 3, 8 and 9, is not critical. For example, the conduit 14 can be connected to the discharge side of the pump of the normal pool water filtration system, to the discharge of an auxiliary pump which withdraws water from the pool or other water supply, to an outlet of a normal household water system or to any other suitable source.

If desired, all of the embodiments of our invention can be operated on an automatic, timed cycle by the provision of a suitable timing device already well-known in the art.

Having fully described the invention and the presently preferred embodiments thereof, we claim:

1. A swimming pool cleaning apparatus, comprising: a manually portable and readily movable weight means adapted to sink in water; said weight means having horizontally disposed structure, the maximum dimensions of which equal a small fraction of the length or breadth of a swimming pool; said weight means being adapted to be manually moved and temporarily located in various desired positions relative to the sides and ends of a swimming pool and on the bottom of said swimming pool; said weight means having supporting surface means adapted frictionally to engage the bottom of a swimming pool; said supporting surface means being the only means for holding said weight means stationarily on the bottom of a swimming pool; a plurality of elongated flexible jet reactive pool cleaning tubes coupled to said weight means at an elevation above said supporting surface so as to dispose a major portion of their length engageable with the bottom of said pool; said pool cleaning tubes substantially equally spaced apart and extending generally radially away from said weight means and having a major portion of said length thereof disposed for engagement with the bottom of a pool when said weight means is supported on said bottom of said pool by said supporting surface means; a flexible water delivery conduit coupled to said weight means and adapted to contain water under pressure in communication with said jet reactive pool cleaning tubes; said jet reactive pool cleaning tubes communicating said water delivery conduit and adapted to receive water under pressure therefrom; said jet reactive tubes each having free and open jet end means substantially spaced from said weight means and adapted to issue a jet of water therefrom and to thereby cause sinuous movement of said pool cleaning tubes relative to said weight means and relative to the bottom and sides of said swimming pool; said weight means being of sufficient magnitude to hold said supporting surface means down in frictionally engaged stationary relationship with the bottom of said pool so that said weight means resists jet reaction forces imposed by said jet reactive pool cleaning tubes whereby said weight means remains stationary on the bottom of said pool while sinuous movement of said jet reactive pool cleaning tubes continues to operate in a manually preselected area around said weight means for creating a generally ring-shaped pattern of dynamic turbulence in the water relative to the center of said weight means.

2. A swimming pool cleaning apparatus, comprising: a manually portable and readily movable weight means

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adapted to sink in water; said weight means having horizontally disposed structure, the maximum dimensions of which equal a small fraction of the length or breadth of a swimming pool; said weight means being adapted to be manually moved and temporarily located in various desired positions relative to the sides and ends of a swimming pool and on the bottom of said swimming pool; said weight means having supporting surface means adapted frictionally to engage the bottom of a swimming pool; said supporting surface means being the only means for holding said weight means stationarily on the bottom of a swimming pool; a plurality of elongated flexible jet reactive pool cleaning tubes coupled to said weight means at an elevation above said supporting surface so as to dispose a major portion of their length engageable with the bottom of said pool; said pool cleaning tubes substantially equally spaced apart and extending generally radially away from said weight means and having a major portion of said length thereof disposed for engagement with the bottom of a pool when said weight means is supported on said bottom of said pool by said supporting surface means; a flexible water delivery conduit coupled to said weight means and extending upward generally in alignment with the center of gravity of said weight means when said weight means is resting on said supporting surface means; said water delivery conduit adapted to contain water under pressure and in communication with said

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jet reactive pool cleaning tubes; said jet reactive pool cleaning tubes communicating with said water delivery conduit and adapted to receive water under pressure therefrom; said jet reaction tubes each having free and open jet means substantially spaced from said weight means and adapted to issue a jet of water therefrom to thereby cause sinuous movement of said pool cleaning tube relative to said weight means and relative to the bottom and sides of said swimming pool; said weight means being of sufficient magnitude to hold said supporting surface means down in frictionally engaged stationary relationship with the bottom of said pool so that said weight means resists jet reaction forces imposed by said jet reactive pool cleaning tubes whereby said weight means remains stationary on the bottom of said pool while sinuous movement of said jet reactive pool cleaning tubes continue to operate in a manually preselected area around said weight means for cleaning the bottom and sides of said pool.

3. The invention as defined in claim 2, wherein: the vertical extension of said water delivery conduit upwardly and in alignment with the center of said weight means provides for vertical suspension of said weight in upright position when lowering the weight means into the pool by means of said flexible water supply or water delivery conduit.

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