

[54] ABOVE-THE-GROUND SWIMMING POOL

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[22] Filed: Mar. 3, 1971

[21] Appl. No.: 120,541

[52] U.S. Cl. 210/169, 210/206, 210/424

[51] Int. Cl. E04h 3/20, C02b 1/18

[58] Field of Search. 210/169, 206, 167, 210/194

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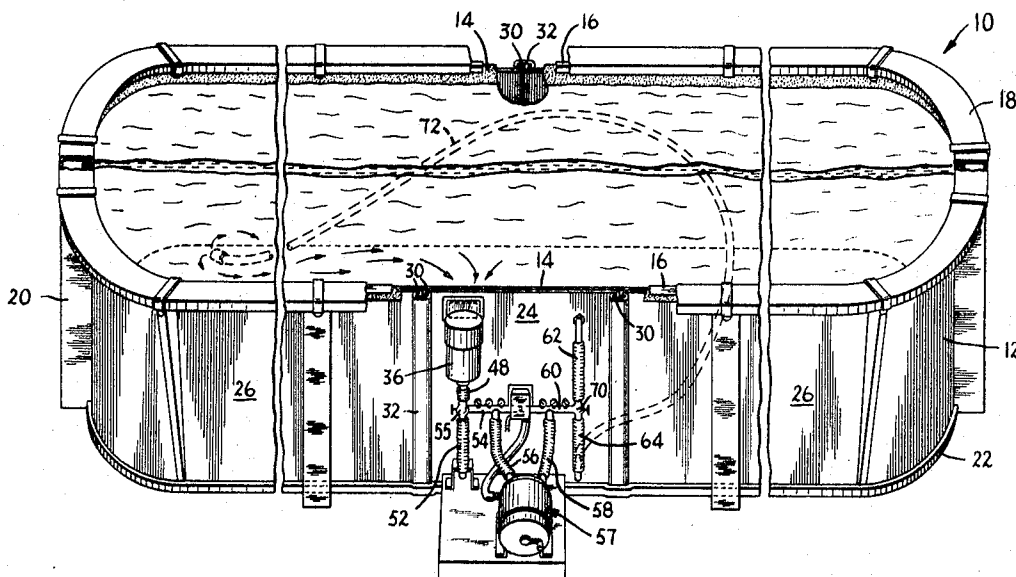
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[57] ABSTRACT

A pool water-conditioning system for installation in an above-the-ground swimming pool is capable of withdrawing water from the pool through an outlet opening near the top of the pool and one near the bottom of the pool, through each exclusively or through both simultaneously, and of reintroducing the water into the pool through an inlet opening near the top and one near the bottom, through each exclusively or through both simultaneously. The wall of the pool can be constructed with a panel element that is interchangeable with other panel elements, each of which has pre-formed openings for receiving the components of the pool cleaning system.

6 Claims, 3 Drawing Figures



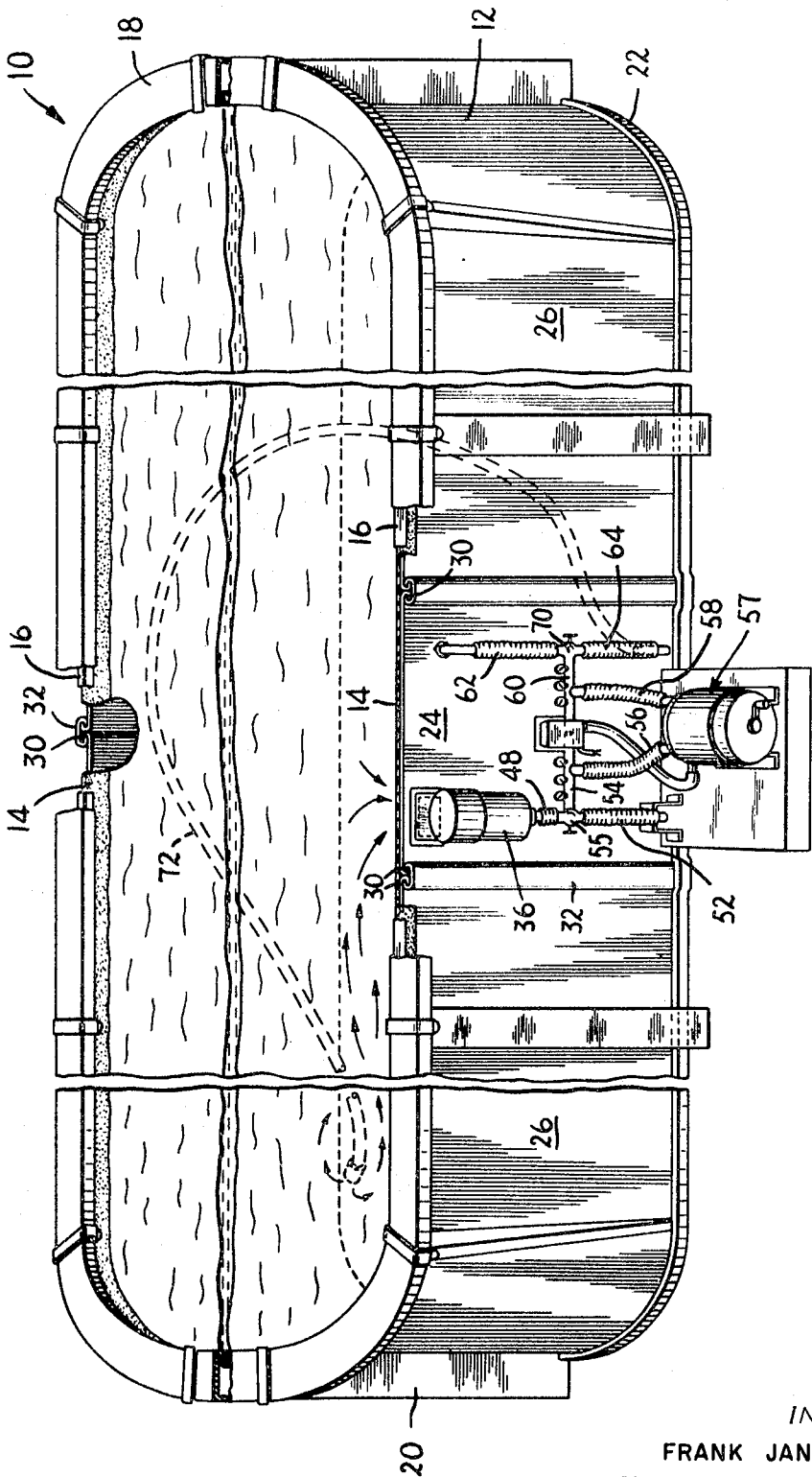


FIG. 1

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FIG. 2

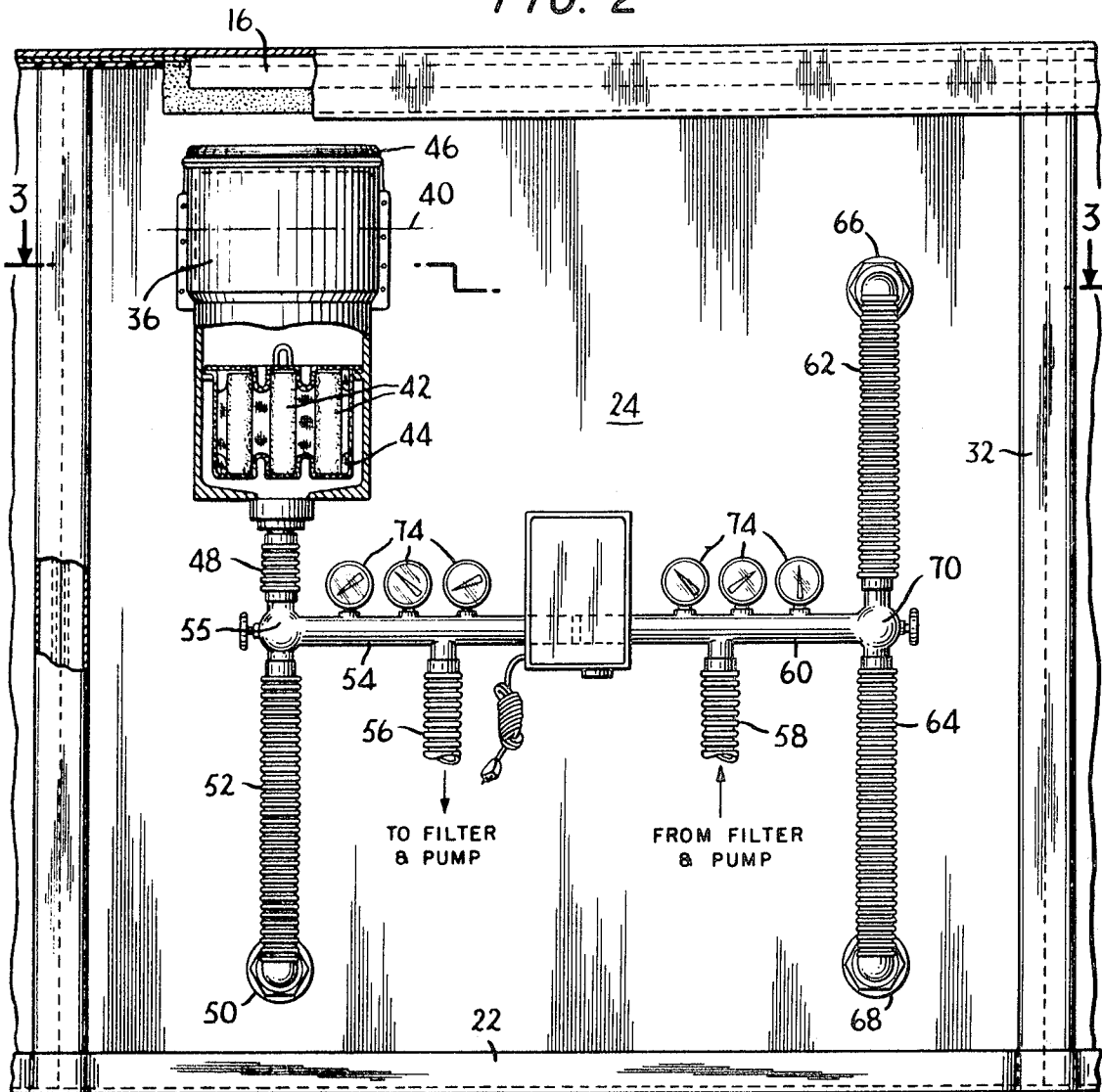
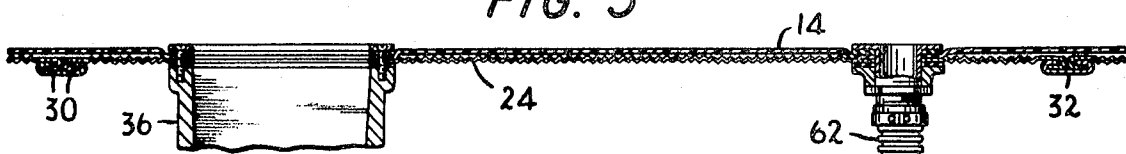


FIG. 3



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ABOVE-THE-GROUND SWIMMING POOL

BACKGROUND OF THE INVENTION

This invention relates to above-the-ground swimming pools and, more particularly, conditioning equipment used in conjunction with such pools, especially those having interchangeable panels with pre-formed openings to accommodate the equipment.

Conventionally, above-the-ground swimming pools comprise an outer structural wall which extends entirely around the perimeter of the pool and which is formed of sheet material, usually of corrugated metal, fiberglass, or the like. An inner liner is provided which is formed of a plastic or other water-impermeable material and is positioned within the outer wall. The inner liner holds the water while the outer wall provides basic support for the water-filled liner. Vertical columns located at a suitable spacing outside the pool wall support the upper rim of the pool.

The water in above-the-ground pools, as in any type of swimming pool, must be cleaned and disinfected on a regular basis, and many types of filtering and chlorinating systems have been developed which are adaptable for use with above-the-ground pools. Some systems simply utilize a hose or conduit that is dropped over the pool wall and into the pool water. This simple system has the disadvantages of being unsightly and very vulnerable to damage by swimmers using the pool. Moreover, in this type of system a head loss frequently occurs in the pump which results in the need to prime the pump to maintain operation of the system.

Other types of cleaning and disinfectant apparatuses have been developed for use with above-the-ground pools, but they normally perform a limited number of operations and are not totally effective for proper conditioning of the pool water. Many systems are designed mainly for portability and sometimes sacrifice effectiveness for low-cost adaptability to the above-the-ground type pool. Moreover, most systems must be operated in a particular manner and do not provide for the various optional forms of cleaning and conditioning operations that can be very useful in maintaining the pool water in top condition.

In most types of pool water-conditioning systems the components are attached to openings which pass through the pool wall and inner liner. The openings, however, sometimes weaken the portion of the pool wall in which they are located, and it may be necessary that the entire wall be fabricated from a material of a greater thickness just to accommodate the openings which are located in only a small portion of the wall. This can significantly increase the cost of the pool.

SUMMARY OF THE INVENTION

As a workable and practical solution to the problem mentioned above, there is provided, in accordance with the invention, an above-the-ground swimming pool that has a structural pool wall formed of sheet material extending around the entire perimeter of the pool, or, in an alternative embodiment, around a substantial portion of the perimeter, the pool wall including a plurality of openings formed in it to accommodate components of pool water-conditioning equipment. The openings include at least two outlet openings through which water can be withdrawn from the pool, one outlet opening being located near the top of the pool wall and another outlet opening being located near the bottom

of the pool wall. An outlet conduit is connected to each outlet opening, the outlet conduits joining a common conduit. A valve is associated with the outlet conduits for selectively withdrawing water from the pool through each opening individually or through all the openings simultaneously. The openings further include at least two inlet openings through which water can be reintroduced into the pool, one inlet opening being located near the bottom. An inlet conduit is connected to each inlet opening, the inlet conduits joining a common conduit. An inlet valve is associated with the inlet conduits for selectively introducing water into the pool through each inlet opening individually or through all the inlet openings simultaneously.

One of the outlet conduits can be connected to a chlorinating device, with the valve regulating the amount of withdrawn pool water flowing through the chlorinating device in accordance with the total amount of water being withdrawn from the pool. In this manner, the level of pool chlorination is, in part, regulated by the valve. The chlorinating device preferably includes a perforated basket having one or more compartments in the path of flow of the withdrawn pool water and is for receiving a chlorine stick.

There can also be provided, in accordance with the invention, a flexible hose extending into the pool and having one end connected to the inlet conduit located near the bottom of the pool wall. The hose oscillates back and forth when water at a sufficient velocity flows into the pool through the hose, thereby agitating dirt lying in the bottom of the pool. With the provision of such a hose, the inlet valve can be adjusted to regulate the amount of water flowing into the pool through the hose in a manner providing a desired level of oscillation or "whipping" of the hose along the pool bottom.

In the alternative embodiment mentioned above, the main structural pool wall can include a pool wall component with vertical ends spaced apart from each other and a removable structural pool wall panel bridging the space between the ends and in which the inlet and outlet openings are formed. The main wall component has no opening, but the panel includes a plurality of openings formed to accommodate the components of the pool water-conditioning equipment described above. The panel is interchangeable with other panels so that if it becomes broken or worn it can easily be replaced without having to purchase an entire new wall.

Because of the inherent structural weakening of the panel caused by the presence of the holes, the thickness of the sheet material forming the panel is preferably greater than that of the sheet material forming the main structural pool wall. To enable the panel to be quickly and easily removed or inserted, adjoining edges of the panel and structural pool wall are hooked and joined by a coupling element.

Among the advantages of the invention are the versatility and relatively simple operation of the water conditioning system described above which can effectively clean and chlorinate the pool water and reintroduce it into the pool in an effective manner by relatively simple adjustments.

As discussed above, when an interchangeable panel is provided, the remainder of the structural pool wall can be formed of material of a lesser thickness without weakening the portion of the pool wall where the openings are located, thereby reducing construction costs of the pool.

In addition, occasionally during installation, the installer does not form a sufficiently tight fit between the components of the pool water conditioning system and the pool wall at the openings and leakage occurs around them. Such leakage causes corrosion and possible ultimate failure of the wall at the openings. By having the holes located in the interchangeable panels, just that panel would have to be replaced and not the entire pool wall if corrosion does occur.

DESCRIPTION OF THE DRAWINGS

For a better understanding of the invention, reference may be had to the following description of an exemplary embodiment, taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a perspective view of an above-the-ground swimming pool constructed in accordance with the invention, selected portions being broken away for clear illustration;

FIG. 2 is a front view of the panel element and the pool water-conditioning system of FIG. 1, the view being on a larger scale than that in FIG. 1; and

FIG. 3 is a top view in section of the panel element illustrated in FIG. 2 and portions of the components of the pool water-conditioning system.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

Referring now to FIG. 1, reference numeral 10 indicates generally an above-the-ground swimming pool embodying the invention. The pool 10 comprises an outer structural wall component 12 formed of a rigid material, such as corrugated sheet metal (see FIG. 3), and an inner liner 14 formed of a flexible plastic film or other suitable water-impermeable material. The outer edge of the inner liner 14 overlaps the upper edge of the outer wall 12 and is attached to it by means of a coping 16. The inner liner 14 is the element of the pool structure that contains the water while the outer wall 12 provides the beaded back-up support for the liner. The pool 10 also includes an upper deck or seat 18 and vertical column supports 20 that back up the wall and carry any loads imposed on the deck 18. A bottom rail 22 extends around the lower perimeter of the wall 12 and maintains the shape of the bottom of the pool 10.

The outer wall 12 is composed of one or more gain wall sections 26 and can extend the entire perimeter of the pool 10, or the wall 12 can have an interchangeable panel 24, which has a number of pre-formed openings in it to accommodate the water-conditioning system. The main wall section 26 may be formed of a single sheet of rigid material, or of more than one sheet, as shown in FIG. 1. Where two or more separate sheets make up the main wall section, they are joined at their adjoining vertical edges by any of a number of types of suitable connectors. A simple and effective connection is provided by bending the edges of the sheets to be joined into a hooked or j-shaped flange 30 and by sliding a c-shaped coupling element 32 over the adjoining j flanges, as illustrated in FIGS. 1 and 3.

As mentioned above, an interchangeable panel 24 can be provided which has a number of pre-formed openings, the panel 24 being preferably formed of a rigid material that is of a heavier gauge than that of the main wall section 26, if a similar material is used, because the openings tend to weaken the panel element 24.

Now, referring to FIG. 2, the components of the novel and improved water-conditioning system are attached to the panel element 24. Reference numeral 36 designates a skimmer that is attached to a rectangular, relatively large outlet opening 38, which is one of two openings through which water can be withdrawn from the pool 10. The opening 38 is located near the top of the pool 10 and the preferred water level, as indicated by the broken line 40 in FIG. 2, is at some point along the vertical dimension of the opening 38. In this way, leaves, scum and other dirt floating on the surface of the water in the pool 10 are drawn into the water-conditioning system to be removed by screening and filtering.

A screen (not shown) is contained within the skimmer 36 in the path of flow of water being withdrawn from the pool 10 for removing the larger-sized foreign matter contained in the water skimmed from the pool water 42 is also positioned within the line of water flow, the basket 42 including compartments 43 that receive chlorine sticks 44, blocks of a slow-dissolving chlorine-containing material. Water being withdrawn from the pool 10 through the skimmer 36 passes over the chlorine sticks 44, dissolves them at a slow rate, the flows on through the perforations in the basket 42 for ultimate return to the pool, thereby providing a simple and effective method of chlorinating the pool water. The skimmer 36 also includes a removable top 46, so that the screen can be removed and cleaned and the supply of chlorine sticks 44 can be replenished from time to time. A conduit 48 is attached to the bottom outlet opening of the skimmer 36 and conducts and contaminated water skimmed from the pool to a filter, as described below.

The panel 24 has another pre-formed opening 50 through which water can be withdrawn from the pool 10, located near the bottom of the pool wall. Attached to the opening 50 is an outlet conduit 52. The conduits 48 and 52 are connected at a T to a common outlet conduit 54. A proportioning valve 55 is located at the juncture of the outlet conduits 48 and 52 and the common outlet conduit 54 and regulates the flow of pool water through the outlet openings 38 and 50 so that water can be withdrawn from the pool 10 through each opening exclusively or through both openings simultaneously. In this manner, the rate of chlorination can be regulated by increasing or decreasing the amount of pool water being withdrawn through the opening 38 and flowing over the chlorine sticks 44, in relation to the total amount of water withdrawn. Also, a desired cleaning result can be attained in accordance with a given condition of the pool; for example, if it is desired to emphasize cleaning of the bottom of the pool, the valve 55 is set to provide relatively higher, or even exclusive, outflow from the bottom outlet, thereby drawing off water and entrained impurities from the lower part of the pool, similarly, skimming from the top of the pool can be emphasized over bottom withdrawal. An infinite range of adjustment is possible, and this feature represents a significant advantage to maintaining the pool water in top condition.

It is readily apparent that a single valve at the juncture of the outlet conduits 48 and 52 and the common outlet conduit 54 can be replaced by a valve located at some point along each of the outlet conduits 48 and 52, with the same results.

An outlet branch conduit 56 is connected at one end to the common outlet conduit 54 and at the other end to a pump and filter 57, which are shown schematically as a single unit in FIG. 1. The pump withdraws water from the pool through the outlet openings 38 or 50, or both (as described above) and pumps it through the filter, from which it is conducted to a main return or for reintroduction into the pool 10.

An inlet conduit section 60 is connected at one end to the return conduit 58 and at the other end to inlet branch conduits 62 and 64. The branch conduit 62 leads to an inlet opening 66 (see FIG. 2) which is located near the top of the pool 10 and below the preferred water level 40, and the branch conduit 64 leads to an inlet opening 68 which is located near the bottom of the pool 10. At the juncture of the inlet conduit section 60 and the inlet branch conduits 62 and 64 is a proportioning type valve 70 which can be controlled to regulate the flow of the filtered and chlorinated water back into the pool 10. The water can be reintroduced through either the top inlet opening 66 or the bottom inlet opening 68, exclusively, or through both simultaneously in a controlled proportions. Also, as described above with regard to the outlet conduits, the valve in the inlet conduits can be replaced by a separate valve in each conduit 62 and 64 and accomplish the same result.

As illustrated in FIG. 1, a flexible hose or "jet whip" 72 may be attached to the lower input opening 68, and extend into the pool 10. By adjusting the valve 70 the proper flow rate through "jet whip" 72 can be regulated. When water at a sufficient velocity is reintroduced into the pool 10 through the "jet whip" 72, it will oscillate or "whip" back and forth and agitate dirt on the pool bottom to dislodge it and put it in suspension. The dirt can then be drawn off through the bottom outlet opening 50 to be removed by the filter, and a more efficient cleaning of the water will be accomplished.

In addition to the filter and pump, a water heater (not shown) and other suitable pool equipment may also be included in the system. Gauges, generally designated by the numeral 76 as illustrated in FIG. 2, can be included in the system to indicate water pressure, vacuum pressure, flow rate, water temperature or other variable factors with regard to the circulated pool water.

An aerator (not shown) can be attached to the conduit 62 near the inlet opening 66 on either side of the pool wall for introducing air into the flowing stream of water that is being reintroduced into the pool. The aerator can simply be a short length of tubing with a valve or other, suitable adjusting means attached to it to regulate the amount of air that is drawn into the stream by the suction caused by the flowing water. The use of this simple device to aerate the water flowing back into the pool has been found to have a pleasing therapeutic effect on a person who stands close to the opening.

thus, there is provided, in accordance with the invention, a water conditioning system for an above-the-ground swimming pool. The embodiment of the invention described above is intended to be merely exemplary, and those skilled in the art will be able to make numerous variations and modifications, in addition to those mentioned above, without departing from the spirit and scope of the invention.

I claim:

1. An above-the-ground swimming pool comprising a structural pool wall panel having a first pair of open-

ings therein located generally one above the other on a first generally vertical center line, one such opening being adjacent the top of the panel, and the other being adjacent the bottom of the panel, and a second pair of openings located generally one above the other on a second generally vertical center line spaced laterally from the first center line, one of the second openings being located adjacent the top of the panel and the other opening being located generally adjacent the bottom of the panel, a skimmer mounted at the top opening of the first pair to receive water withdrawn from the top of the pool, conduit means associated with the first pair of openings for receiving water from the pool through said first pair of openings, pool water conditioning means coupled to said first conduit means to receive water therefrom, said first conduit means including a common branch connected to the pool water conditioning means, a first branch connected from the common branch and to an outlet from the skimmer and a second branch connected from the common branch to the lower opening of the first pair, first valve means for selectively proportioning the flow of pool water through the first and second branches of said first conduit means selectively to withdraw water from the pool through each of the first pair of openings individually or through both of said first pair of openings simultaneously in an infinitely variable proportion, second conduit means connected to the pool conditioning means for returning water therefrom to the pool through the second pair of openings and including a common branch connected to said pool water conditioning means, a first branch connected to the upper opening of the second pair and second branch connected to the lower opening of the second pair, and second valve means for selectively proportioning the flow of water through the first and second branches of said second conduit means selectively to return water to the pool from the pool water conditioning means through each of said second pair of openings individually or through both of said second pair of openings simultaneously in an infinitely variable proportion.

2. An above-the-ground swimming pool in accordance with claim 1 wherein each of said first and second valve means is a single three-way flow proportioning valve located at the juncture between the common branch and the first and second branches of the respective first and second conduit means.

3. An above-the-ground swimming pool according to claim 2 wherein said first and second branches of both of said first and second conduit means are axially aligned, and wherein the common branches of both said first and second conduit means are axially aligned.

4. An above-the-ground swimming pool in accordance with claim 1 wherein a flexible hose extends into the pool and one end of the hose is connected to the inlet conduit located near the bottom of the pool wall, whereby the hose oscillates back and forth when water at a sufficient velocity flows into the pool through the hose, thereby agitating dirt lying on the bottom of the pool, the inlet valve means regulating the amount of water flowing into the pool through the flexible hose in relation to the total amount of water flowing into the pool.

5. An above-the-ground swimming pool in accordance with claim 1 and further comprising chlorinating means, said chlorinating means including a porous container with at least one compartment disposed in one

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of the conduits of the first conduit and thus in the path of flow of the withdrawn water, the compartment being capable of receiving a quantity of chlorine dissolvable by the water.

6. An above-the-ground swimming pool in accordance with claim 5 wherein the chlorinating means in-

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cludes a receptacle disposed in the skimmer housing below the normal water level therein and in communication with the water passing through the skimmer housing, and at least one body of slow-dissolving, chlorine-containing material received in the receptacle.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,749,244

Dated July 31, 197

Inventor(s) FRANK JANNUZZI, SR.

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

First page, item [76], "Jr." should be --Sr.--; Column 1, line 13, "porvided" should be --provided--; line 52, "signigicantly" should be --significantly--; Column 2, line 42, "opening" should be --openings--; Column 3, line 24, "il4ustrated" should be --illustrated--; line 46, "gain" should be --main--; Column 4, line 2, "watre-conditioning" should be --water-conditioning--; line 19, after "water" insert --surface. A porous container such as a perforated basket--; line 19, "with in" should be --within--; line 24, "rate, the" should be --rate, and--; line 33, "and" (second instance) should be --the--; line 54, "tom of the popl" should be --bottom of the pool--; Column 5, line 23, delete "a"; line 26, "62 and 62" should be --62 and 64--; line 41, "includes" should be --included--; line 51, "othe," should be --other,--; line 57, "thus" should be --Thus--.

Signed and sealed this 5th day of March 1974.

(SEAL)

Attest:

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Attesting Officer

C. MARSHALL DANN
Commissioner of Patents