United States Patent [19]

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[54] **POOL CLEANING DEVICE**

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[52] **U.S. Cl.** .....**134/167 R**, 4/172.15

[51] **Int. Cl.** **B08b 3/02**, B08b 9/08

[58] **Field of Search** ....134/24, 167 R, 168 R; 15/1.7; 4/172.15, 172.16

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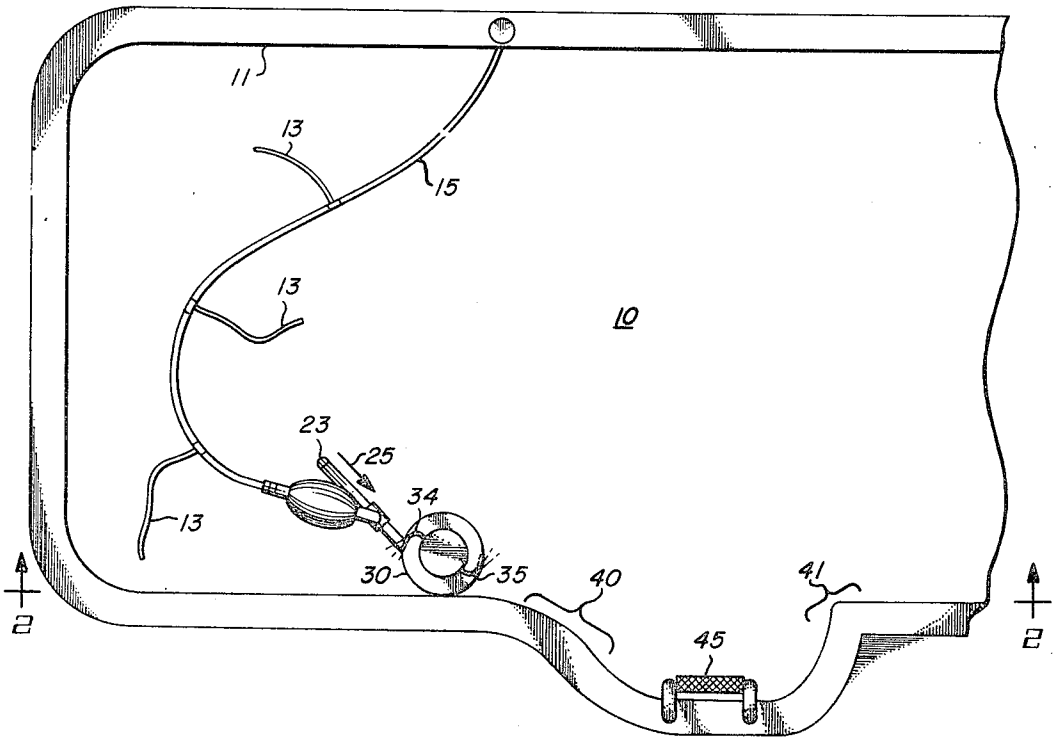
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[57] **ABSTRACT**

A rotating platform is provided with water jets directing water therefrom so as to have a horizontal component of velocity tangential to the platform resulting in the rotation of the platform. An inflexible supply conduit is connected at one end thereof to the platform and is provided with a water jet at its opposite end to urge the platform into contact with the pool side while simultaneously providing water to the jets mounted on the platform. A flexible conduit is connected to the pool pump and to the inflexible conduit to supply the latter with water under pressure for operation.

2 Claims, 5 Drawing Figures



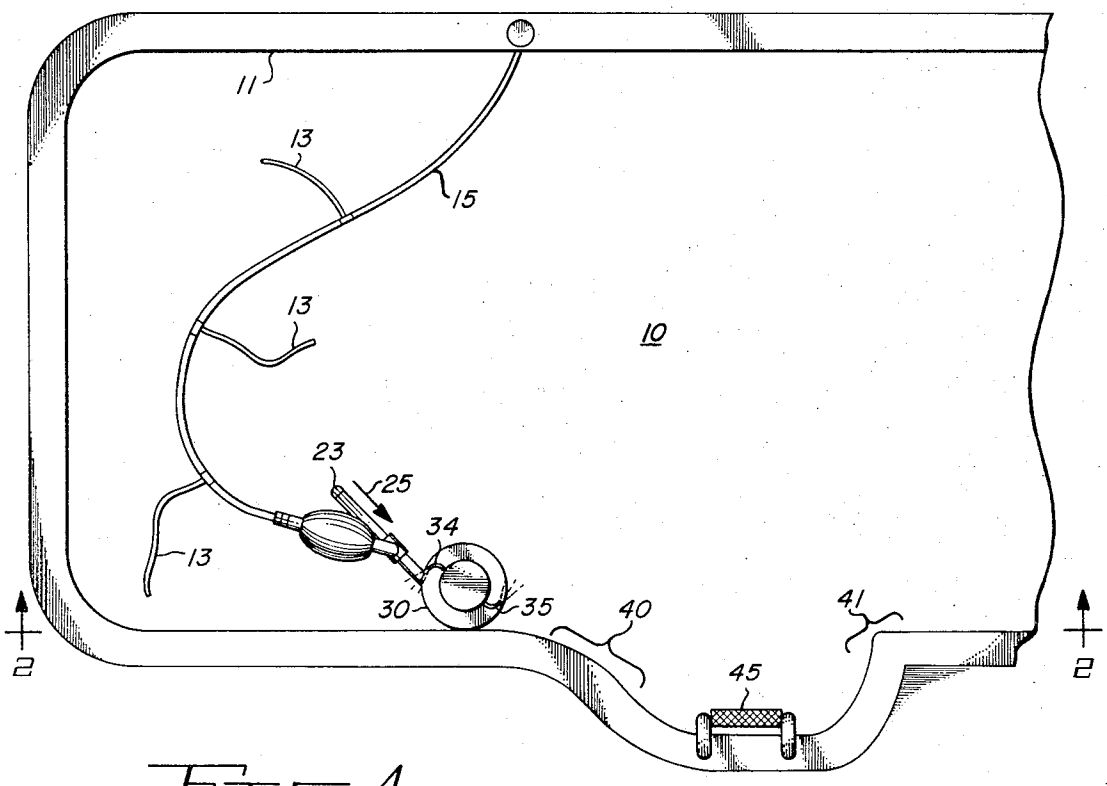


FIG. 1

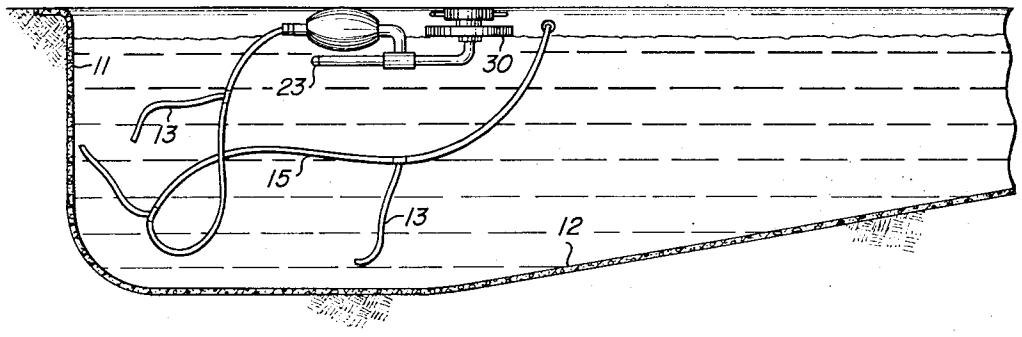


FIG. 2

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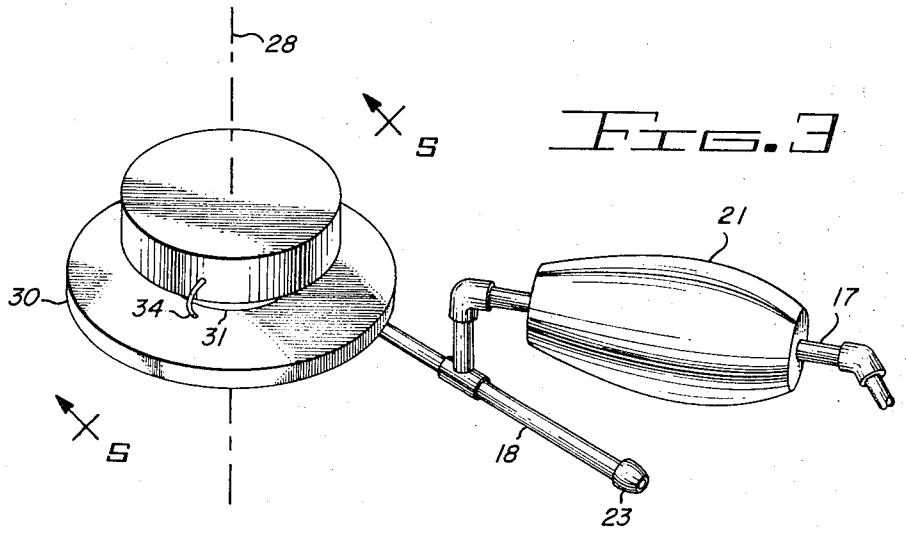


FIG. 3

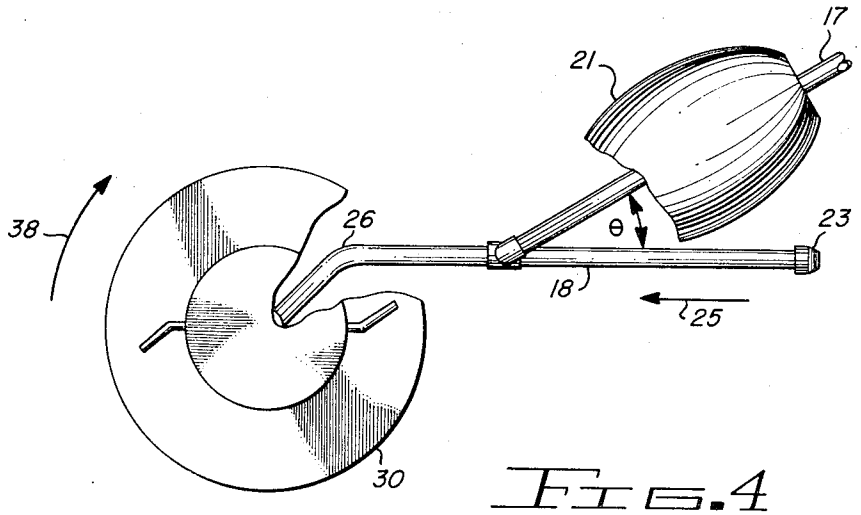
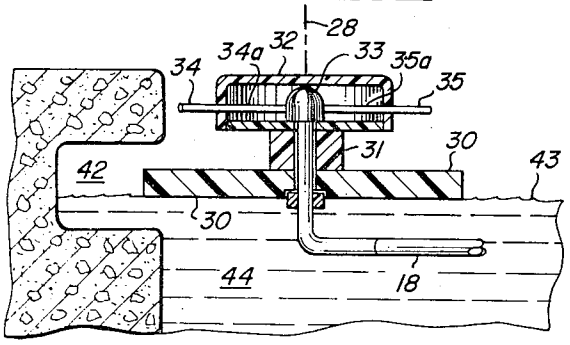


FIG. 4

FIG. 5



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POOL CLEANING DEVICE

The present invention pertains to pool cleaning systems and more particularly to a pool cleaning device for directing a spray of water against the side of the pool adjacent the water line while transporting pool cleaning hoses that are free to "whip" while directing streams of water therefrom in a well known manner.

It has long been known that flexible hoses provided with water under pressure at one end and suspended in a pool unconnected at the other end may be utilized to randomly spray a stream of water against the side and bottom of the swimming pool to ensure the maintenance of the suspension of particles in the water. The suspension of particles enables the normal pool filtering system to effectively maintain the desired condition of the pool without the otherwise necessary vacuuming operations. However, a variety of cumbersome and complicated schemes have been suggested in the prior art for causing the cleaning hoses to traverse the pool and thus uniformly clean all portions thereof; further, the prior apparatus either inadequately covers the entire pool or frequently stalls and entirely fails to transport the cleaning hoses.

In addition to the above difficulties many of the prior art devices neglect the sides of the pool in the vicinity of the water line.

It is therefore an object of the present invention to provide a pool cleaning device for transporting cleaning hoses about the pool.

It is also an object of the present invention to provide a pool cleaning device that is self-propelled and follows the contour of the pool water line to ensure proper cleaning of the entire pool.

It is still another object of the present invention to provide a pool cleaning device having a means of directing a stream of water at the pool side adjacent the water line to dislodge dirt and sediment that may otherwise collect.

These and other objects of the present invention will become more readily available as the description proceeds.

Briefly, in accordance with a chosen embodiment of the invention a circular floating rotatable disc or platform is provided with a pair of water-directing nozzles that direct water out from the platform with a velocity tangential thereto to cause the platform to rotate about a vertical axis. An inflexible supply conduit communicates with the nozzles at the axis of rotation of the platform and extends downwardly and horizontally therefrom. The end of the inflexible supply conduit remote from the floating platform includes a water jet or nozzle for generating a thrust and urging the inflexible conduit and platform into contact with the pool side. The inflexible supply conduit includes an offset between the ends thereof so that the line of thrust does not pass through the vertical axis of rotation of the platform. A second inflexible supply conduit is connected to the first conduit intermediate the ends thereof at an angle of less than 45°. A flexible supply conduit or hose is connected to a source of water under pressure and to the second inflexible supply conduit. A plurality of cleaning hoses are spaced along and connected to the flexible conduit and depend therefrom to provide a random "whipping" action to clean the bottom and sides of the pool below the water line.

The present invention may more readily be described by reference to the accompanying drawings, in which:

FIG. 1 is a top view of a portion of a swimming pool incorporating the pool cleaning apparatus of the present invention.

FIG. 2 is a cross-sectional view of FIG. 1 taken along line 2—2.

FIG. 3 is a perspective view of a pool cleaning apparatus constructed in accordance with the teachings of the present invention.

FIG. 4 is a top view of the apparatus of FIG. 3.

FIG. 5 is a cross-sectional view of a portion of FIG. 3 taken along line 5—5.

In referring now to the drawings a swimming pool **10** includes side walls **11** and bottom **12** which are to be cleaned by the system of the present invention. A plurality of cleaning hoses **13** are supported from a flexible conduit **15** which is connected to a suitable source of water under pressure (not shown) such as the pool recirculating pump. The cleaning hoses **13** direct jets of water therefrom and consequently "whip" to randomly direct these jets against the bottom and sides in a manner well known in the art. The flexible conduit **15** supplies water through inflexible conduit **17** to inflexible conduit **18**. It may be noted that the former is provided with a float **21** to help support the cleaning hose and flexible conduit **15**. The conduit **18** includes at one end thereof a small opening **23** for directing a stream of water axially thereof thereby producing a thrust indicated by the arrow **25** in FIGS. **1** and **4**. The conduit **18** includes an offset **26** such that the direction of thrust **25** does not pass through the vertical axis **28**.

A floating rotatable platform **30** is provided and, in the embodiment chosen for illustration, is formed of a circular disc rotatable around the axis **28**. The conduit **18** passes up through the platform **30** and is connected to a rotating head **33** that in turn communicates with nozzle **34** and **35**. The nozzles are formed to direct water therefrom with a horizontal component of velocity the reaction to which results in the rotation of the platform **30** in the direction indicated by the arrow **38**. An upper platform or disc **32** may be formed around the conduits **34***a* and **35***a*, and is fixed to the platform **30** by a spacer **31**. The upper platform **32** prevents the device from becoming jammed or entangled in the event the platform **30** attempts to enter an opening such as the skimmer opening **42** provided adjacent the surface **43** of the water **44**.

The angle θ formed by the inflexible conduits **17** and **18** is less than 45° and is preferably approximately 30°. It has been found that this angular relationship provides sufficient thrust to force the platform **30** against the side **11** of the pool regardless of the curvature (e.g., the negative curvature of the side of the pool in the area **40** or the sharp corner of the pool in the area **41**).

The operation of the device may now be described. Water under pressure flowing in the flexible conduit **15** is admitted to the conduit **18** resulting in a jet of water from the opening **23**. The thrust propels the platform against the side of the pool. The water supplied to the conduit **18** is also delivered to the nozzles **34** and **35** causing the platform **30** to rotate; thus, the platform frictionally engages the sides **11** of the pool **10** and "walks" about the periphery thereof. As the platform **30** rotates and thus moves the platform about the periphery of the pool, the water jets eminating from the nozzles **34** and **35** continuously strike the side of the pool immediately above the water line.

If the platform should strike an object such as the ladder 45 the rotating motion of the platform causes the platform to move out and around the obstruction and back into contact with the pool wall on the opposite side of the obstruction. The interrelationship among the thrust along the inflexible conduit 18, the angle between conduits 17 and 18, and the rotational motion of the platform 30 results in the continuous smooth movement about the periphery of the pool regardless of the curvature or configuration of the pool and regardless of obstructions positioned at the pool side. It has been found that the angular velocity of the platform 30 may be varied within wide limits without significantly affecting the performance of the device, however, the angular relationship between conduits 17 and 18 may be critical such that outside of the limits above described the platform 30 will either not properly follow the contour of the pool and may even follow a circular or spiral path toward the center of the pool without contacting the sides thereof.

The present invention utilizes the motive force of the rotating platform against the pool side to move the flexible conduit 15 about the pool. The device thereby not only continuously moves the cleaning hoses 13 but also continuously cleans the sides of the pool adjacent the water surface. The system of the present invention readily passes over submerged obstruction such as steps since a depth of only a few inches is required beneath the platform 30; in practice, it has been found that a depth of only three inches is required to permit the platform to pass. Further, only one moving part is utilized in the entire design.

It will be obvious to those skilled in the art that many modifications can be made without departing from the spirit of the invention; for example, inflexible conduit 17 need not include the float 21 and indeed may be of extremely short length sufficient only to ensure the proper angular relationship between the conduits 17 and 18. It is also obvious that the platform 30 may be constructed in a variety of configurations.

I claim:

1. A pool cleaning device comprising: a rotatable floating platform having a vertical axis of rotation; at least one water jet mounted on said platform to direct water therefrom, the water being directed by said water jet with a horizontal component of velocity tangential to said floating platform to rotate said platform; means urging said floating platform to contact the sides of said pool, said means including an inflexible supply conduit rotatably connected at one end thereof to said platform and having an orifice at another end thereof to direct a stream of water therefrom, said supply conduit having a horizontal offset between the ends thereof; a source of water under pressure; a flexible conduit connecting said source to said inflexible supply conduit; and including a second inflexible supply conduit connected to and forming an angle with said first mentioned inflexible supply conduit between the ends thereof, said angle being less than 45°.

2. A pool cleaning device comprising: a rotating floating platform having a vertical axis of rotation; at least one water jet mounted on said platform to direct said water therefrom against the pool side for cleaning the side immediately above the water line, the water being directed by said water jet with a horizontal component of velocity tangential to said platform; means urging said floating platform in contact with the sides of said pool, said means including an inflexible supply conduit rotatably connected at one end thereof to said platform and having an orifice at another end thereof to direct a stream of water therefrom, said supply conduit having a horizontal offset between the ends thereof so that the direction of the force resulting from the stream of water directed from said orifice is offset from said axis of rotation; a source of water under pressure; a flexible conduit connecting said source to said inflexible supply conduit; and including a second inflexible supply conduit connected to and forming an angle with said first mentioned inflexible supply conduit between the ends thereof, said angle being less than 45°.

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