June 22, 1971 A. J. JACOBS 3,585,654

QUICK-DISCONNECT POOL CLEANING APPARATUS

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Fig. 1

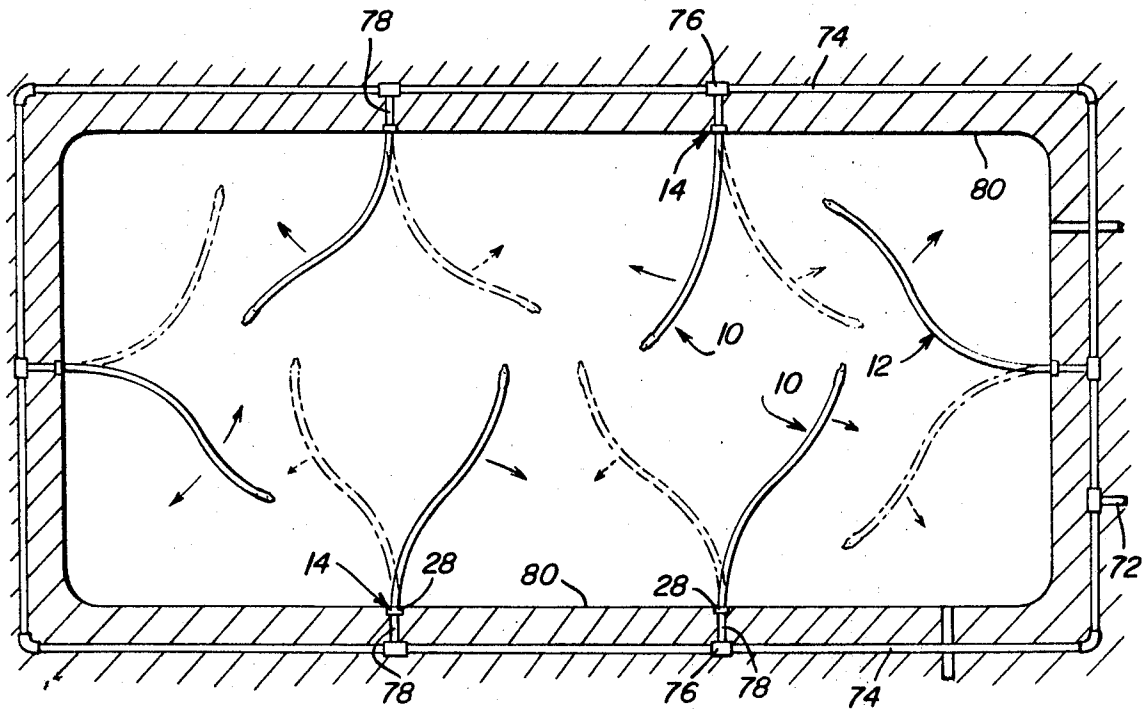
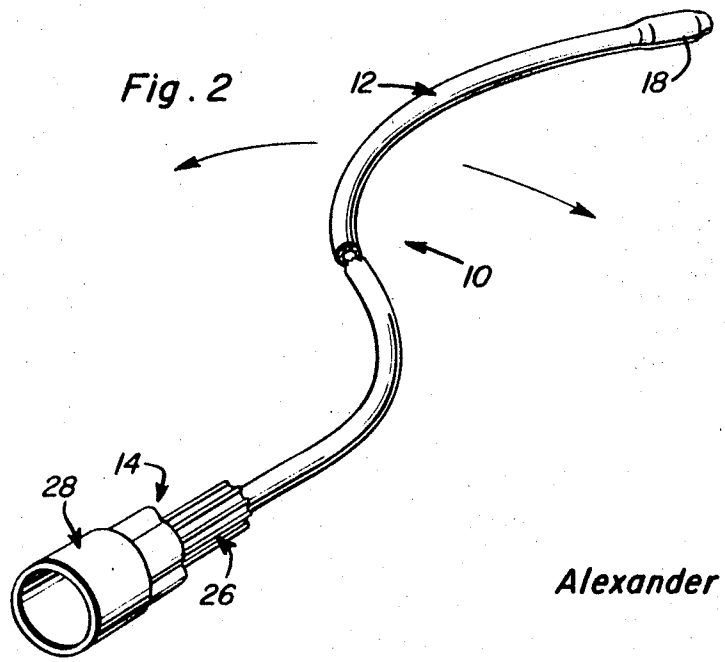


Fig. 2



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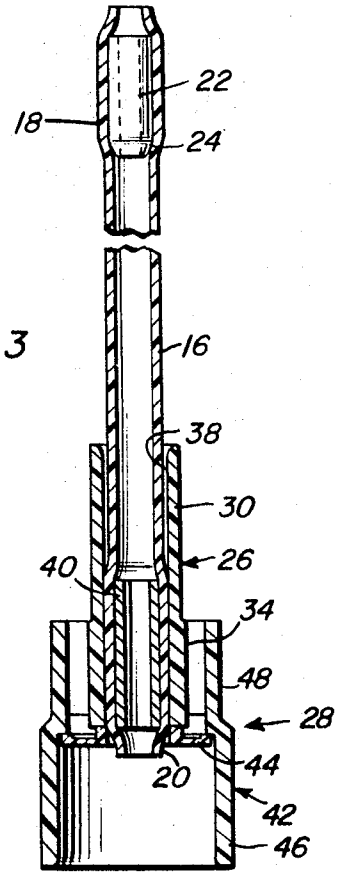
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QUICK-DISCONNECT POOL CLEANING APPARATUS

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Fig. 3



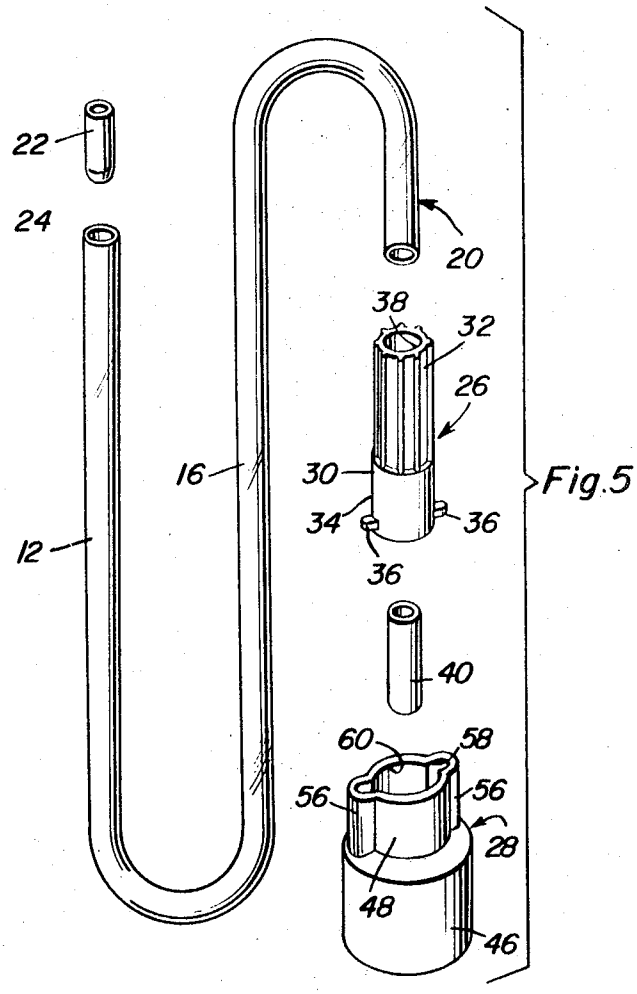


Fig. 5

Fig. 6

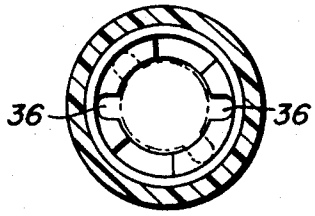


Fig. 7

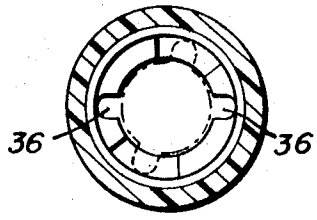


Fig. 4

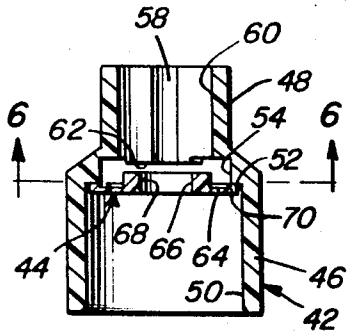
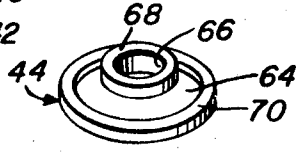


Fig. 8



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QUICK-DISCONNECT POOL CLEANING APPARATUS

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Int. Cl. B08b 9/00
U.S. Cl. 4—172.15 3 Claims

ABSTRACT OF THE DISCLOSURE

A device for use in cleaning swimming pools that utilizes a plurality of flexible conduits with nozzles on one end thereof to keep sediment in suspension in the water to be filtered out by the pool's filtering system. The conduits are fitted with a quick-disconnect type fitting at their other end to fit into flush mounts in the side of the pool.

The cleaning and maintaining of a pool in a clean condition is one of the major maintenance aspects of a swimming pool. Heretofore, periodic brushing of all of the surfaces of the pool was necessary to loosen silt or other sediment that might have accumulated thereon, which then required a thorough vacuuming of the pool to complete the cleaning operation. In most pools, the flow of water through the filter system does not create enough agitation in the pool to keep the sediment and other debris from settling so that it cannot be filtered out which increases the rapidity with which the above-mentioned cleaning cycle must be repeated. Also, the movement of the water being insufficient it is usually a time consuming operation to raise or lower the temperature of a pool by heating or cooling the water entering through the normal outlets from the filtering system. Further, when the aforementioned cleaning operations are taking place it is usually not advisable to permit swimmers in the pool, thereby requiring temporary closing of the pool or overtime work on the part of the pool personnel to accomplish the cleaning operation.

The present invention generally relates to a device for cleaning a pool that keeps the water of the pool agitated so that the sediment is kept in suspension in the water to be thereby removed by the pool's filtering system. The device is provided with a quick-disconnect fitting in the side of the pool that mounts flush, thereby leaving no dangerous projections on the pool surface when not in use. The device can be used as often as is necessary without affecting the use of the pool, or it can be left in use constantly. The device is simple and economical in construction thereby not requiring costly apparatus or many man-hours to use. The device consists of a series of flexible conduits with nozzles on the free end thereof and a quick-disconnect fitting on the other end. The quick-disconnect fittings attach to flush receptacles in the pool wall. As many of the conduits can be installed along the pool wall as is necessary to insure complete agitation of the water in the pool. The initial investment for the device is low and it can be incorporated into the pool's filtering system to discharge filtered water therein not requiring any additional pumping machinery or other costly apparatus.

It is therefore an object of this invention to provide a simple but unique and efficient pool cleaning apparatus.

It is a further object of this invention to provide a pool cleaning apparatus that accomplishes the cleaning by agitating the water thereby further preventing stagnation.

It is a further object of this invention to provide a pool cleaning apparatus that can be quickly connected and disconnected to the water supply provided therefor.

It is a still further object of this invention to provide a quick-disconnect pool cleaning apparatus whose flush receptacle mountings in the pool wall leave no projections therefrom.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIG. 1 is a plan view of a pool with the subject invention installed therein.

FIG. 2 is a perspective view of a single unit of the subject invention.

FIG. 3 is a sectional view of the conduit and its quick-disconnect coupling assembly.

FIG. 4 is a sectional view of the receptacle that is mounted in the pool wall.

FIG. 5 is an exploded perspective view of the components of the conduit and its quick-disconnect coupling assembly.

FIG. 6 is a sectional view taken along the line 6—6 of FIG. 4.

FIG. 7 is a view similar to FIG. 6 showing the conduit in its locked position in solid lines, and its unlocked position in phantom.

FIG. 8 is a perspective view of the pressure disk which provides the locking force for the quick-disconnect fitting.

Referring now to the drawings, numeral **10** generally designates the subject cleaning device, while numeral **12** indicates the flexible conduit and numeral **14** designates the quick-disconnect fittings. The flexible conduit **12** of the cleaning device comprises an elongated flexible member **16** which is hollow and has a nozzle **18** at one end thereof with the other end **20** of the member being attachable to the quick-disconnect assembly. The nozzle **18** is formed by inserting a tubular element **22** into the free end of the hollow flexible member **16**. The tubular element **22** has a taper **24** at one end thereof to facilitate the forcing of the element into the hollow member. The outside diameter of the tubular element **22** is larger than the inside diameter of the hollow member thus providing a tight fit to prevent loss of the tubular element from the hollow member due to water pressure. The inside diameter of the tubular element **22** is smaller than the inside diameter of the hollow member **16** thus providing for an increase in velocity of the water passing therethrough. With the increase in velocity of the water exiting the nozzle end **18** of the flexible conduit **12** a vigorous whipping about of the member is assured.

The quick-disconnect fitting **14** of the present invention has a male assembly **26** mounted on the end of the hollow member **16** remote from the nozzle and a female assembly **28** to be mounted in communication with a water supply. The male assembly **26** comprises an elongated cylindrical member **30** which has a fluted section **32** over the majority of its length to provide an easy to grasp surface when in the water so that a person desiring to mount the conduit assembly **12** will have no trouble therewith. The remainder of the cylindrical member **30** is smooth with the outside circumference **34** being the same or slightly larger than the outside circumference of the ridges on the fluted section **32**. Two locking lugs **36** are mounted diametrically opposed on the circumference of the section **34** and coplanar with the end thereof. The inside diameter **38** of the cylindrical member **30** is slightly larger than the outside circumference of the hollow member **16** so that the member may be easily inserted through the cylindrical member **30**. To secure the end **20** of the hollow member **16** to the cylindrical member **30** the end **20** is inserted through the cylindrical member to extend slightly therefrom, as shown in FIG. 3, and a rigid tubular element **40**

is then inserted into the end **20** of the hollow member **16**. The outside diameter of the tubular element **40** is somewhat larger than the inside diameter of the end **20** of the hollow member. This relationship then will securely clamp the end **20** of the hollow member between the outside circumference of the tubular element **40** and the inside surface of the cylindrical member **30**.

The female assembly **28** of the quick-disconnect fitting comprises a rigid outside housing **42** and a relatively flexible pressure disk **44** mounted there inside. The housing **42** has a lower section **46** of enlarged diameter tapering to an upper section **48** of reduced diameter. The inside diameter **50** of the lower section **46** extends upwardly for about half the length of the rigid outside housing **42** where it terminates in an abutment **52** which forms a flange through which opens a continuation of the inside diameter but of reduced diameter **54**. The reduced diameter section **54** extends upwardly a short distance where it terminates adjacent the upper section **48**. This section **54** forms the locking chamber of the housing **42**. The upper section **48** of the housings **42** has two diametrically opposed semi-circular housings **56** attached to the outside circumference thereof. These housings **56** have a semi-circular inner circumference **58** which opens into the inside diameter **60** of the upper section **48**. The openings **58** and **60** thus form a keyway-type opening which continues downwardly in the upward section **48** until it opens into the locking chamber **54**. The inside diameter keyway thus formed has a slight projection **62** which extends downwardly into the locking chamber **54** for a short arcuate distance adjacent the semi-circular openings **58**.

The flexible pressure disk **44** has an outside diameter slightly less than the diameter **50** of the lower section of the housing **42** so that it can be received therein. The disk has a main flat washer-like base **64** with an opening **66** through the center thereof. The base member **64** has a circular abutment **68** surrounding the opening **66** in the center thereof. A similar circular abutment **70**, but of reduced height, extends around the circumference of the washer-like base **64** thus presenting two upwardly extending circular abutments. The disk **44** is not made of the same rigid material as the housing **42** but rather of a more flexible, but similar nonmetallic, material. The disk is adapted to be received within the diameter **50** with the abutments **68** and **70** extending upwardly towards the reduced upper diameter section therein. The outer abutment **70** is adapted to be engaged and fixed to, such as by fusion or gluing, the abutment **52**. The disk then completes the formation of the reduced diameter locking chamber **54** within the center of the housing **42**.

In operation the conduit section **12** with the male assembly **26** mounted on the end **20** thereof is inserted into the female assembly **28** by aligning the locking lugs **36** the semi-circular openings **58** in the top section of the housing **42**. The cylindrical member **30** is then pushed downward along the inside diameter **60** of the upper section of the housing until the end **20** of the conduit section that protrudes beyond the end of the cylindrical member **30** engages the inner circular abutment **68** on the pressure disk. The pressure disk being relatively flexible, it can be forced downwardly so that the locking lugs will clear the projection **62** in the locking chamber **54**. When the locking lugs have thus cleared the projection the cylindrical member **30** is rotated approximately 90° thereby allowing the locking lugs to enter the locking chamber and when the member is released by the user the pressure disk will push the cylindrical member **30** upwardly thereby forcing the locking lugs into the raised portion of the locking chamber **54** beyond the projections **62**. This then prevents inadvertent rotation of the cylindrical member to align the locking lugs with the openings **58** and subsequent loss of the unit. The water pressure acting against the pressure disk **44** also aids in sealing the male and female members together against loss of pressure. As shown in FIG. 3, the end **20** of the flexible conduit extending beyond the cylindrical member **30** engages the opening **66** through the pressure disk so that when the pressure disk is forced upward through its own resiliency and the pressure of the water therebehind further sealing is effected therewith.

FIG. 1 of the drawing shows a typical installation of the cleaning assembly and its quick-disconnect fastenings into the sides of a pool. A water supply pipe **72** extends from the pump and filtration room of the pool which feeds a supply pipe **74** that extends around the circumference of the pool embedded in the wall thereof. Spaced periodically along the supply pipe are "T" fittings **76** with short feed pipes **78** that progress perpendicularly toward the walls **80** of the pool. Each of the feed pipes **78** is of a diameter to be received snugly within the inside diameter **50** of the lower section of the rigid housing **42**. The feed pipe **78** and the housing are suitably sealingly fixed to one another with the end of the upper section **48** of the housing mounted in coplanar relationship with the walls of the pool. Thus, the existing or common filtration and pump assemblies are used with the device and are used to feed in at openings spaced around the perimeter of the pool. When it is desired to clean the pool a sufficient number of the conduit assemblies **12** are attached by grasping the fluted sections **32** of the male assembly **26** and inserting the assembly into the flush mounted female assembly **28** and securing it therein. The pool could thus be cleaned overnight without anyone attending thereon or without the expending of time or labor on the part of pool personnel. Similarly, the cleaning action and apparatus is unobtrusive enough that it could progress while the pool is being used by swimmers. Also, as mentioned hereinabove, the number of outlets spaced around the perimeter of the pool insure constant agitation of the water so that stagnation thereof will not occur.

What is claimed as new is as follows:

1. A device for cleaning swimming pools, comprising: a flexible conduit assembly including a plurality of elongated flexible tubes each being provided with a nozzle means in one end thereof and a connector means attached to the other end thereof, means mounted in the wall of the pool to cooperate with each connector means to releasably attach the tube thereto with pressurized water supplied to said cooperating means to pass through said tubes, said connector means being a rigid cylindrical member received over the other end of said tube and fixed thereabout, said means mounted in the wall of the pool being a cylindrical casing receiving pressurized water in one end and removably receiving the cylindrical member in the other end, the end of the casing removably receiving the cylindrical member being substantially flush with the wall of the pool to eliminate projections into the pool when the conduit assembly is removed, said cylindrical casing having means thereon cooperating with means on said cylindrical member to releasably hold the cylindrical member within said cylindrical casing to enable quick connect and disconnect of the tubes.

2. The device of claim **1** wherein said cooperating means is a cylindrical opening in the other end of said casing extending through a portion thereof with a pair of diametrically opposed semi-circular grooves opening into the circumference of said cylindrical opening and being coextensive therewith, and a resilient disk with a central opening therethrough fixed to said casing in spaced relation to the inner extent of said cylindrical opening and grooves.

3. The device of claim **2** wherein said means on said cylindrical member is a pair of lugs diametrically mounted on the outer surface of said cylindrical member and coplanar with the ends thereof received in said casing to be received in said grooves in said cylindrical opening, said cylindrical member extending said resilient disk to permit said lugs to be received in said space between the disk and the cylindrical opening and grooves and to be rotated out of alignment therewith to secure said cylindrical member

therein with the water passing through the opening in said disk and then into said tube.

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U.S. Cl. X.R.

134—167; 285—361