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SWIMMING POOL CLEANER DEVICE AND METHOD

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FIG-1

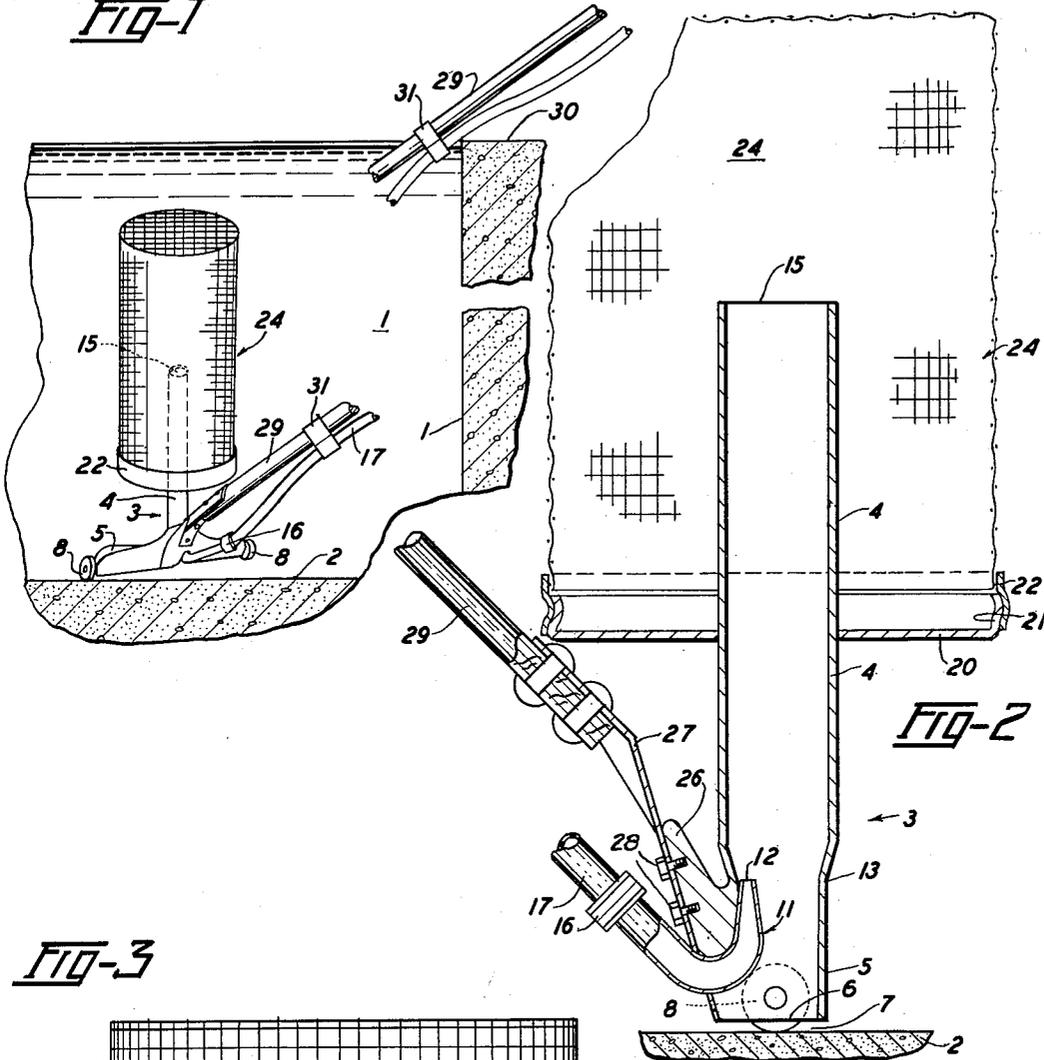


FIG-2

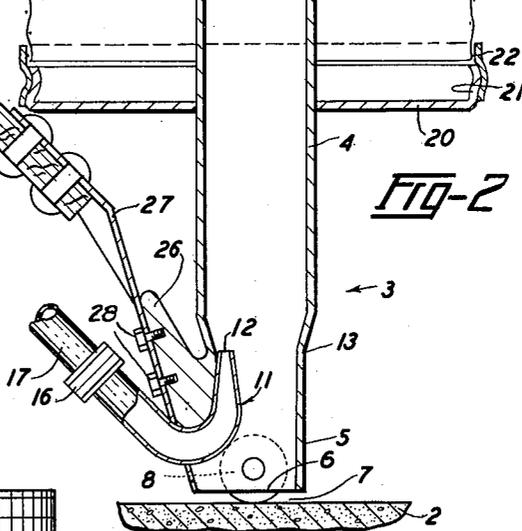
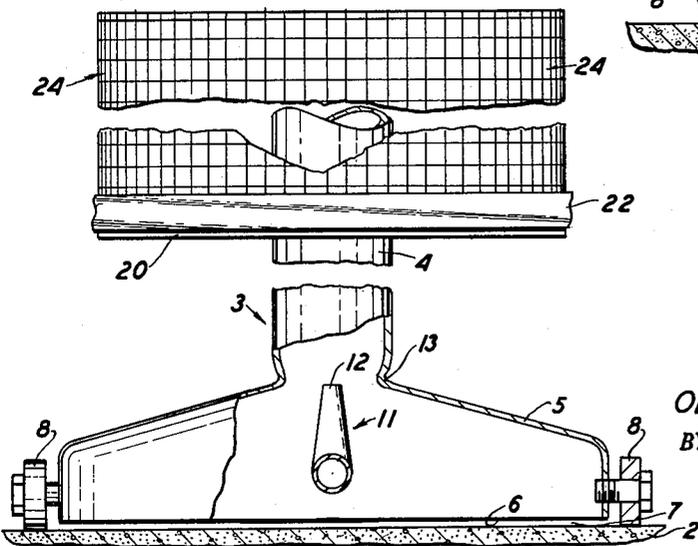


FIG-3



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SWIMMING POOL CLEANER DEVICE AND METHOD

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4 Claims. (Cl. 210—11)

This invention relates to a device for cleaning the water in a tank and more particularly to a device for removing sediment and debris from the bottom of a tank such as a swimming pool.

Heretofore various devices have been provided for removing sediment, leaves, grass and other foreign material from swimming pools, but for the most part, such devices are cumbersome to use and generally include a pump or other suction means for pumping water from the pool. Ordinarily, there is provided a housing having a mouth which is positioned close to the bottom of the pool and through which the water in the pool is drawn to a suitable tank outside of the pool for subsequent separation of the foreign material. Obviously, a great deal of power is required to pump the water completely out of the pool and the actual handling of the water entails the use of large, heavy flexible hoses which are difficult to handle even by the strongest men.

Furthermore, prior art devices must include some provision, such as strainers and filters for separating the sediment and other foreign matter before the water from the pool reaches the pump, even if the water is not to be reused.

The main object of the present invention is the provision of a swimming pool cleaning device which overcomes the disadvantages of prior art devices of like nature.

Another object of the invention is the provision of a swimming pool cleaning device which is light in weight, easy to handle, and inexpensive to manufacture.

Still another object of the invention is the provision of a swimming pool cleaning device which obviates the usual step of removing water from the pool in order to clean the same, thereby greatly simplifying the auxiliary apparatus required in carrying out the cleaning operation.

Yet another object of the invention is the provision of a novel method of cleaning the bottom of a swimming pool, or any submerged surface without removing water from the pool or tank.

Another object of the invention is the provision of a novel method and apparatus for cleaning swimming pools and the like which is relatively inexpensive to carry out and operate and which requires no power in addition to the usual domestic water supply.

Another object of the invention is the provision of a novel method for cleaning swimming pools and the like which results in replenishing the fresh water in the tank or pool.

Other objects and advantages will be apparent from the following specification and from the drawings.

Fig. 1 is a vertical cross sectional view through a tank or swimming pool showing the invention in operating position.

Fig. 2 is a vertical cross-sectional view through the conduit of the invention.

Fig. 3 is a side elevational view of the device at right angles to Fig. 2 with portions of the conduit broken away to show internal structure.

The invention will be described in connection with a

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swimming pool having sidewalls 1 and a bottom 2 (Fig. 1) but it will be understood that the use of the device is not necessarily restricted to such an application.

In detail, the invention comprises a relatively large diameter conduit generally designated 3 which includes an upper cylindrical pipe portion 4 and a lower enlarged mouth portion 5. Mouth 5 is preferably much larger in cross sectional area than pipe portion 4 and terminates in a lower edge 6 (Figs. 2, 3) which defines an inlet through which water from the pool or tank passes into conduit 3.

When the device is used for cleaning the bottom of a pool or tank the lower edge 6 of mouth 5 is preferably spaced a slight distance from the bottom 2 providing a peripherally extending space 7 through which water from the pool enters the conduit 3.

The mouth 5 is preferably elongated transversely of conduit 3 and is provided at its opposite ends with wheels 8 for supporting the housing 3 for movement over the bottom 2.

Centrally of one of the elongated sidewalls of mouth 5, the same is provided with an opening for receiving there-through a nozzle 11. This nozzle 11 is secured to mouth 5 and provided with a discharge opening 12, positioned adjacent the juncture 13 between the pipe 4 and the mouth 5 of conduit 3, and which discharge opening is directed generally upwardly for discharging water along the length of pipe 4 and out through the open end 15 of the latter.

At the end of nozzle 11 opposite its discharge end, a coupling 16 is provided for connecting said nozzle to one end of a flexible hose 17. An ordinary garden hose may be employed.

The nozzle 11 is preferably bent to permit the discharge end to be directed upwardly and to permit the inlet end to be connected by coupling 16 to a generally upwardly extending hose 17.

Intermediate the ends of pipe portion 4 of conduit 3 an annular plate 20 is secured to said pipe by welding, brazing or in any other desired manner. Around the periphery of plate 20 and integral therewith is an upstanding threaded flange 21 which is adapted to threadedly receive a correspondingly threaded collar 22.

Collar 22 is secured, as by brazing, to the open end of cylindrical basket or trap 24 which is preferably formed from relatively fine wire mesh.

By the above defined structure it is seen that the trap 24 may be removed from, or inserted on, the annular plate 20 by rotating the same relative to the stationary threads on flange 21 of plate 20. It will also be noted that the plate 20 provides an imperforate bottom for the trap 24.

The upper discharge end 15 of pipe 4 is preferably positioned about centrally between the opposite ends of trap 24 so as to provide a maximum area of screen through which water may be discharged into the pool.

Considering Figs. 2, 3, the operation of the device is as follows: Water discharged under pressure through nozzle 11 from the domestic water system, flows in the form of a jet along the length of pipe 4 thereby inducing a flow of water in a stream from the surrounding water in the pool through the peripherally extending space 7 between the bottom 2 of the pool and the inlet of mouth 5. The water from nozzle 11, together with the entrained water, is discharged through the discharge end 15 of pipe 4 and thus into the body of water that is in the pool or tank. However, any sediment or other material that is in the discharged water stream is collected in the trap 24.

In this connection, it should be noted that by positioning the mouth 5 close to the swimming pool bottom 2, the velocity of water through the space 7 may be made

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relatively high thus causing such water to pick up any debris or sediment on the bottom 2. Inasmuch as the velocity of the water stream discharged from the discharge end of pipe 4 is suddenly reduced upon striking the stationary body of water in the pool, very fine particles, which might otherwise pass through the fine mesh screen of trap 24, will drop to the bottom of the trap and collect on plate 20. Thus, the device is not only adapted to clean the bottom of leaves, pods, grass, coins and the like but also fine particles of sand and dirt. Of course it will be understood that the trap screen may be made extremely fine because the total area of the perforate sides and top of the trap is many times greater than the area of the pipe 4.

Adjacent the nozzle 11 the conduit 3 is thickened as at 26 to receive a bracket plate 27 which may be secured to the thickened portion 26 by screws 28. Secured to plate 27 is one end of an elongated rod or pole 29 which is long enough to permit manual manipulation of the device from any point on the bank 30 of the pool (Fig. 1).

The hose 17 may be supported along a portion of its length by means of a plurality of brackets 31 which serve to releasably secure the hose to the pole. The hose 17 should, of course, be of sufficient length to extend at its end opposite coupling 16 to a source of water under pressure (not shown).

By the above described structure it will be apparent that the user may readily insert the device within the pool by means of handle 29 and manipulate the same over the entire area of the pool bottom.

After the cleaning operation has been completed it is merely necessary to shut off the water supply, remove the device, and empty the foreign material from trap 24.

Although the greatest use for the invention is in cleaning the bottom of a swimming pool the device can readily be used as a skimmer to clean the water surface of floating material. In such a case, the device is merely turned so that the trap 24 is directed downwardly and the inlet 6 is just below the surface of the water. Any material floating on the surface of the water is entrained in the induced stream of water and is collected in trap 24.

The hose 17 need not necessarily be secured along the length of pole 29 but may take its own course to the source of water supply. However, at least one bracket 31 is desirable adjacent the lower end of the handle to reduce the drag of the hose on the bottom of the pool.

Although the nozzle 11 is shown positioned adjacent one side of mouth 5, it will be apparent that it may be positioned so that its jet is coaxial with pipe 4. However, as a practical matter, the exact position of the nozzle 11 transversely of the conduit has been found not to be critical and by placing it adjacent the inner side of the mouth 5, it is easier to secure the same to the conduit.

The foregoing detailed description of the invention is not to be taken as restrictive of the same as it is obvious that minor variations in design may be made without departing from the spirit of the invention.

I claim:

1. The method of removing foreign material from a surface submerged in a body of water and simultaneously replenishing said body with fresh water comprising the steps of: introducing fresh water under pressure into said body in the form of a jet directed away from said surface thereby inducing a flow of the water of said body in a

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stream with a portion of said stream in wiping engagement with said surface and directing said stream through a trap for collecting said material therein, and thereafter returning the water of said stream to said body.

2. A cleaning device for removing foreign material from a tank of water comprising: a conduit having opposite inlet and outlet ends and adapted to be submerged in the body of water in said tank, a nozzle in said conduit directed toward said outlet end and a hose connected at one end with said nozzle and connected at its other end with a source of fresh water under pressure for discharging a jet of water from said nozzle thereby inducing a flow of water in a stream along said conduit whereby said stream is discharged through said outlet end into said body, and a water pervious trap submerged in said body of liquid and connected to said outlet end for collecting foreign material in said stream.

3. A cleaning device for removing foreign material from a tank of water comprising: a conduit having opposite inlet and outlet ends and adapted to be submerged in the body of water in said tank, a nozzle in said conduit directed toward said outlet end and a hose connected at one end with said nozzle and connected at its other end with a source of fresh water under pressure for discharging a jet of water from said nozzle thereby inducing a flow of water in a stream along said conduit whereby said stream is discharged through said outlet end into said body, a water pervious trap submerged in said body of liquid and connected to said outlet end for collecting foreign material in said stream, and means for spacing said inlet end a relatively short distance from a wall of said tank whereby foreign material on said wall will be carried into said conduit by the flow of water from said body between said inlet end and said wall.

4. The method of removing foreign material from a surface submerged in a body of liquid comprising the steps of: introducing a jet of fresh water into said body to induce a flow of water in a stream moving in the direction of said jet, constraining said stream so that a portion thereof is in wiping engagement with said surface whereby said material is entrained in said stream, removing said material from said stream, and thereafter returning the water of said stream to said body.

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