This invention relates in general to devices for the cleaning of swimming pools, and more particularly to a device having utility for the removal of leaves from swimming pools.

The removal of foreign matter from swimming pools presents a major problem in their upkeep, and numerous devices have been designed to such end, one of which is disclosed in Patent No. 2,725,356, wherein a jet type aspirator is incorporated in a wheeled head adapted for travel over the floor of a pool. Although such portable equipment may be useful for the pickup of dirt, they are susceptible to clogging by leaves, inasmuch as they rely on a venturi, or reduced cross section, suction effect for effective pickup.

When leaves fall into a pool they float for a certain period of time until they become water-logged. They then sink to the bottom of the pool where their slimy, limp condition makes them very difficult to handle by the means heretofore employed in efforts to effect their removal. A manual raking operation to collect the leaves together generally entails either partial or full submersion of the individual doing the cleaning job in order to fully clear the leaves from the pool.

Another object of this invention is to provide a device for the removal of leaves from a swimming pool while the same is in a filled or partially filled condition.

A further object of the invention is to provide a device of the character described utilizing one or more jets for impingement upon leaves contained within a pool to pick up and push said leaves into a trap or collecting means, and for the holding of said leaves within the collecting means after initial deposit therein.

Another object is to provide a device, as above described, having particular utility for the removal of sunken leaves from swimming-pool floors and for the removal of floating leaves from the surface of water contained within swimming pools.

Still another object of the invention is to provide a device which is relatively simple in its construction and operation, not requiring the removal of fittings, filter bags or the like, for ultimate removal of the foreign material delivered into the collector means.

Other objects and advantages of this invention will become apparent from the following description when taken in conjunction with the drawings in which:

FIGURE 1 is a view in section illustrating the invention in operating position upon a swimming pool floor.

FIGURE 2 is a view of the device in end elevation.

FIGURE 3 is a view in section taken on the line 3-3 of FIGURE 2 showing the jet forming nozzle in detail.

FIGURE 4 is a view in side elevation illustrating the device in use as a swimming pool surface scavenger.

FIGURE 5 is a view in perspective of a modification of the invention, partially broken away to show interior details of construction.

FIGURE 6 is a view in section of the modified embodiment of FIGURE 5, with the pivotal movement of the lower section of the conduit and the jet-forming cross head attached thereto shown in phantom.

FIGURE 7 is a partial view in perspective of a further modification of the invention.

In FIGURE 1, the device is shown positioned upon a swimming pool floor 8 in operating position, with a jet issuing from aperture 10 (FIGURE 3) of nozzle 12 and pushing leaves 14 into a trap, or basket, 16 through the open lower end 18 of the trap. The trap 16 is of cylindrical shape closed at its upper end and provided with a water permeable end and side walls to permit submersion and operation in a water-filled pool. The trap 16 may be made of any suitable material which will freely permit water passage through its walls and which is of sufficient rigidity to retain its approximate shape. In practice I have found that one-half inch galvanized wire mesh is satisfactory for the purpose, offering a durable, rigid trap, or basket, the contents of which may be quickly and easily emptied.

A conduit, or tubular member, 20 is secured within trap 16 to extend along the inner surface of the trap side wall, the upper, or coupling, end of member 26 extending through the wall of the closed upper end of the trap and the lower, or discharge, end being obliquely turned and extending slightly beyond the trap open end 18. A coupling 22 is provided at the upper end of the conduit for its connection at a flexible hose 24, the latter being connected with a pressurized source of water supply.

In FIGURE 3, the turned lower end of conduit 20 is shown interiorly threaded for reception therein of the communicating nozzle 12, which latter is bevelled at its forward end 26. Tip 26 is useful for effecting dialogue of leaves 14 or like debris which may have a tendency to adhere to the pool floor. 8. When the tip is moved upwards the leaves, the leaves are caused to move upwardly over the tip by the jet emitted from nozzle aperture 10. It is important to note that the aperture 10 is obliquely disposed with its axis directed upwardly to the rear and as to direct the jet issuing therefrom outwardly from the center of the open lower end 18 of trap 16. By thus arranging the aperture, debris passing therewith is lifted and pushed into trap 16 through its open lower end to be thereafter within the basket by the continuing action of the jet.

Support and guidance for the above assembly is provided by a pole 28, which is releasably secured within a bevelled-end clamp 30 which may be readily formed by splitting a length of flexible hose. 42. The clamp 30 is secured to extend along the outer surface of the trap side wall in opposed relation to the conduit 20, being secured to the latter by means of screws 32 which serve to interconnect the trap, the conduit, and the clamp.

As previously indicated, the invention may also be used for the scavenging of floating leaves from the pool water surface, which operation is illustrated in FIGURE 4, a pool side wall being indicated at 34. In such use, the relationship of the trap and conduit is reversed from that shown for floor pickup in FIGURE 1, although the general principle of operation is the same, i.e., the jet impinges against the surface debris to push the same into the trap 16 and to thereafter hold the debris in trapped position.

In FIGURES 5 and 6 is illustrated modification of the invention which incorporates an open-ended cylindrical trap 36, clamp 38, and pole 40, arranged as described above, with a conduit 42, extending along the inner surface of the trap side wall, being coupled at its upper end to a flexible hose 44. The conduit 42 is broken to provide a lower section 46 and an upper section 48, said sections being connected by a flexible joint comprising a sleeve 52 within which the adjacent conduit section ends are received. Connected to and in communication with conduit section 48 is a tube 50 having a jet opening directed toward the closed end of trap 36. As indicated in phantom in FIGURE 6, flexure of the conduit 42 is limited to one plane only by a pair of parallel triangular guide members 54 secured interiorly of the trap and spaced apart for receipt therebetween of conduit section.
46. A tubular member, or cross head, 56 is disposed at the end of the conduit section 46, being in right angle relationship therewith and having at either end apertures 58 from which issue jets generally directed to converge at or near the center of the lower end of the trap.

By permitting pivotal movement of the conduit, the trap may at all times be positioned with the lower lip of its open end closely adjacent, or in contact with, the pool floor 60, as illustrated in FIGURE 6, notwithstanding substantial variations in the inclination of the trap 36, as effected by the pole support or by the angle of inclination of the pool floor portion being worked. Further, by providing the flexible joint in the conduit sufficiently distant from the open end of the trap 36, the jets emitted from apertures 58 are at all times directed into such open end.

In operation, the water jets sweep over the pool floor impinging against the leaves and forcing them into the trap wherein they are held in packed relation by a jet issuing rearwardly from aperture 62 provided in the tube 50. The water, forced by way of jets into the trap, thereupon passes through the trap walls for return to the pool.

In FIGURE 6, the closed end of trap 36 comprises an imperforate circular plate 64. Use of such a plate will prevent water from passing through the trap to wet the operator during surface skimming of debris when the device is used as in FIGURE 4.

In FIGURE 7 is shown a further modification of the invention which is generally similar to the embodiment of FIGURES 5 and 6 but which incorporates a modified jet-effecting tubular member or cross head 68. The conduit lower section 66, like its counterpart in FIGURE 1, is obliquely turned at its discharge end with an aperture 70 provided therein for directing a jet toward the center of the trap opening. The tubular member 68 secured in right angle relationship with the conduit section 66, is provided at each end with downturned legs 72, each having an aperture provided for formation and direction of a jet toward the center of the open end of the associated trap. Like the jets of the FIGURE 5-6 embodiment, these jets converge and, with the jet issuing from aperture 70, coax to push the leaves and force them into the trap. The leg jets prevent side wandering of the leaves once they begin to be pushed. In practice, the downturned legs 72 were made approximately two inches in length to permit adequate passage for the leaves under the cross-head for entrapment and subsequent entry into the trap as the jets sweep over the floor of the pool.

From the above it can be seen that I have provided an extremely simple and effective device for the collection from water filled pools of debris of a relatively large character, such as leaves, paper and the like, which normally subject a suction cleaning device to clogging. By positively pushing such debris into a trap through impingement with one or more water jets and holding it there by jet action, a trap with an opening of considerable size is permitted and the problem of clogging thus substantially eliminated. Further, emptying of the trap is easily effected by simply discharging the debris, as by shaking, through the open end of the trap, an operation which usually need not be done until completion of the cleaning operation of an average size pool under normal conditions.

What is claimed is:

1. A leaf cleaning device for swimming pools comprising an elongated cylindrical water pervious leaf trap fully open at its lower end and closed at its upper end, a water conveying conduit extending longitudinally through said trap and being fixedly secured thereto, said trap having an internal diameter which is a plurality of times greater than the external diameter of said conduit, said conduit extending outwardly through the lower open end of said trap and terminating in a water discharge portion including orifice means therein positioned to direct a jet of water into the lower open end of said trap to thereby urge leaves into said trap through the lower open end thereof, said water discharge portion being laterally unenclosed whereby said portion may be brought into physical engagement with leaves lying on the bottom of a swimming pool.

2. A leaf cleaning device for swimming pools comprising an elongated water pervious leaf trap having a substantially uniform transverse cross-section along its length, said trap having a fully open lower end and a closed upper end, a water conveying conduit extending longitudinally of said trap and being fixedly secured thereto, said conduit having a portion extending past the open lower end of said trap, and nozzle means in said conduit portion positioned to direct a jet of water from said conduit portion into the open lower end of said trap substantially centrally thereof, said conduit portion being laterally unenclosed whereby said portion may be brought into physical engagement with leaves lying on the bottom of a swimming pool.

3. The combination of claim 2, including means secured to said conduit for clamping the device to a support member for the manual guidance of said device.

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