A skimmer having an upper chamber with a floating weir-controlled inlet, a lower chamber for holding a leaf basket, and a lateral chamber for a main drain connection, is provided with a rotary valve diaphragm cover for the lower chamber and a plug valve for the lateral chamber. By adjusting the two valves to different combinations of positions, the skimmer can be utilized to set the circulatory system of the pool for 1) normal skimming, 2) application of suction to the main drain in the pool bottom, for jet sweeping operation, or 3) vacuuming.

8 Claims, 5 Drawing Figures
SWIMMING POOL SKIMMER WITH VACUUM AND SWEEPING CONTROLS

BACKGROUND OF THE INVENTION

Swimming pool skimmers of a type embodying an inlet throat having a floating weir and leading into an upper chamber from which water is drawn downwardly through a leaf basket supported by its rim in a lower chamber, have been widely used in home swimming pools for a number of years past. One such skimmer is shown in Bosico U.S. Pat. No. 3,173,865. Such skimmers have also commonly been provided with a float valve to isolate the bottom area of the chamber from its upper area in the event the water level therein drops to a minimum near the bottom of the chamber, so as to prevent air from being drawn into the pump line which applies suction to the bottom of the chamber; and with an equalizer line leading from the pool into the bottom of the lower chamber and controlled by a restricting check valve where it discharges into the chamber, for regulating and limiting the negative pressure developed in the lower chamber.

SUMMARY OF THE INVENTION

The present invention provides a skimmer of the type outlined above, except that it does not have a float valve in the lower chamber of the skimmer, and in addition, it provides a lateral valve chamber to the main drain line (leading from the bottom of the pool) is connected; a plug valve which is rotatably operable to selectively cut off the main drain connection (e.g., for vacuuming operation); and a diaphragm valve which covers the lower chamber and is rotatable operable to regulate the volume of flow from the upper to the lower chamber, and which has a closed position in which it provides for communication between a vacuum cleaner hose and the lower chamber beneath it and cuts off communication between the skimming inlet and the lower chamber, so that the full suction of the pump inlet line can be applied to the vacuum hose.

OBJECTS OF THE INVENTION

The general object of this invention is to provide a skimmer having self-contained valve means for cycling a swimming pool circulatory system from normal filtering operation to sweeping operation or to vacuuming operation and back to normal filtering operation.

This and other objects will become apparent in the following specification and appended drawings, wherein:

FIG. 1 is a vertical transverse sectional view of a skimmer embodying the invention;
FIG. 2 is a horizontal sectional view thereof, taken on line 2—2 of FIG. 1;
FIG. 3 is a plan view of the equalizer valve;
FIG. 4 is a sectional view thereof; and
FIG. 5 is a sectional perspective view of the skimmer.

Referring now to the drawing in detail, I have shown therein, as an example of one form in which the invention may be embodied, a skimmer having an inlet duct A leading into an upper chamber B; a lower chamber C containing a leaf basket L, a connection to a main drain line D leading to the bottom of the pool; a lateral chamber F communicating with the upper chamber B and with the drain connection; another connection (at the bottom of lower chamber C) to a line P leading to the pool circulation system pump; a diaphragm valve V covering the top of lower chamber C, to control the flow from the upper to the lower chamber; a plug valve V1 disposed in the lateral chamber F, to control flow from the main drain D into lower chamber C; and an equalizer valve V2 (FIGS. 3 and 4) controlling flow from equalizer line E into the lower chamber C.

Chambers B, C and F are defined within a housing comprising upper and lower sections 10 and 11 secured together at 12. Inlet duct A is integral with upper section 10. A removable lid 13 normally closes the top of section 10 and cooperates therewith to define upper chamber B. Lid 13 is of transparent material, providing a "see-through" function for inspection of the internal condition of chamber B. Lateral extensions 14 and 15 on housing sections 10 and 11 respectively cooperate to define lateral chamber F. A main drain connection boss 16 is formed as an integral downward projection from the bottom of lateral extension 15. Connections to pump line P and equalizer line E are provided by integral outlet and inlet members 17 and 18 on the bottom of housing section 11. Equalizer valve V2 covers the equalizer port defined in the bottom of housing section 11 at the upper end of inlet member 18.

The skimmer is installed in the deck 20 of a pool having a sidewalk 21 and an inlet port 22 with which the duct A communicates. A conventional floating weir 23 controls the inflow through duct A. Equalizer line E communicates with the pool through wall 21. The circulation pump (not shown) has its inlet connected to line P to apply suction to lower chamber C. Chamber F communicates with upper chamber B through a top opening in housing extension 14, and with lower chamber C through a lateral opening in lower housing section 11.

A separator plate 25 (FIG. 2) has a circular flange 26 fitted into an enlarged rim portion 27 of lower housing section 11 and resting on an annular offset shoulder 28 joining such rim portion to the main body of section 11. Rim 26 and shoulder 28 are continued in a horizontal plane around lower housing extension 15, and separator plate 25 has a lateral extension 29 fitted into the rim extension and seated on its shoulder. The main body of separator plate 25 is in the form of an upwardly protruding circular valve seat crown of inverted pan form having a cylindrical offset lateral rim wall 31 and a flat top valve seat wall 32 integrally joined to flange 26 by wall 31. In the rim wall 31 are a plurality of (e.g., three) skimming openings in the form of circumferentially elongated slots 33 spaced equidistantly around the wall 31.

Valve V is of inverted pan form, comprising a flat disc 35 and a cylindrical rim 36. Disc 35 is seated on the top wall 32 and its rim 36 is rotatably fitted around lateral wall 31. The valve is held down against the valve seat disc 35 by a rivet or bolt 37 located at its center and allowing the valve to be rotated relative to the valve seat. In the valve rim 36 are a plurality of circumferential slot openings 38 corresponding to valve seat slots 33 and adapted to be registered therewith, either fully or partially by selective rotation of the valve, thereby to define ports for skimming flow from upper chamber B into lower chamber C as indicated by arrows. The rim webs separating the slots in the valve and
valve seat members are somewhat longer in circumferential extent than the slots themselves, whereby the valve V may be rotated to a position in which the slots of one member are completely closed by the rim webs of the other member and vice versa, thus cutting off flow from upper chamber B to a lower chamber C. Valve V may be provided with diametrically opposed wings 39 for engagement by an operator's fingers to rotate the valve.

For vacuuming, the valve disc 35 is provided with an opening 41 which, in a closed position of valve V will register with a vacuum coupling fitting in the form of an integral depending open sleeve 42 on valve seat 32, whereby the end nipple of a vacuum hose (not shown) may be inserted through the opening 41 and wedged into the sleeve 42 for a vacuuming operation. The preferable type of hose for such use is one having an end nipple of soft, resilient rubber or elastomer material.

Plug valve V1 comprises a cup-shaped valve body 45 loosely projecting through an opening 46 in separator plate extension 29 and having a pair of diametrically opposite lugs 47 integral with its lateral wall and projecting outwardly for resting on a pair of diametrically opposed lands 48 integral with and projecting upwardly from extension 29 along the edge of opening 46. Lands 48 have ramp ends 49 communicating with arcuate slots 50 in extension 29. At their outer ends, lands 48 have upwardly projecting stop lugs 51. In a normal position of valve V1, the lugs 47 rest on lands 48 to support the valve cup 45 in an elevated position in which its bottom is spaced from the upper end of main drain boss 16 to provide for free flow from drain line D into lower chamber C for a bottom sweeping operation.

For the sweeping operation, the valve V is rotated to a closed position in which the ports through slots 38, 33 are completely closed. In this position, the opening 41 will be in closed relation to the opening in sleeve 42 to maintain a satisfactory vacuum in chamber C sufficiently to draw water from the bottom of the pool.

On the underside of separator plate extension 29 are diametrically opposed downwardly projecting lands 55 having ramp ends and stops 49 and 51 corresponding to those of lands 48. By rotating valve cup 45 until lands 47 drop through slots 50, and then continuing the rotation until lands 47 are engaged beneath lower lands 55, the cup 45 will be locked in a closed position in which its bottom is rested against the upper end of main drain boss 16, thus effectively closing off the main drain connection for a vacuuming operation in which the suction in lower chamber C is concentrated and applied to the vacuum hose coupled to sleeve 42.

For normal filtering operation, the valve V is adjusted to an open position in which an adequate flow through skimming inlet duct A may pass through ports 33, 38 into lower chamber C and thence be drawn through suction line P into the circulation pump. In travelling through chamber C the flow passes through leaf basket L which retains the leaves and other floating debris.

The equalizer valve V2 comprises a valve poppet 60 mounted by a compression spring 61 to a bracket arm 62, normally seated over the mouth of equalizer fitting 18 and adapted to be unseated when insufficient water enters duct A to maintain a primed condition, such as when the water level in the pool is below inlet duct A. For vacuuming and sweeping operations, the valve can be locked in closed position by means of a lockout arm 63 mounted for swinging movement on a post (e.g., screw) 64 which also mounts the bracket arm 62 on top of arm 63. Lockout is effected by swinging the arm 63 to a position beneath arm 62, in which arm 63 will engage above the hub boss of poppet 60 to hold it down against the equalizer inlet 18.

1. A swimming pool skimmer comprising, in combination:

  a housing having a skimming inlet, an upper chamber communicating with said inlet;
  a lower chamber having an outlet for application of pump suction, and partition means separating said chambers, said partition means including a circular valve seat having an eccentrically disposed skimming flow opening;
  a valve disc rotatable on said seat on a vertical axis, said disc having an eccentrically located skimmer opening adapted to register with said seat opening in a selected open position of rotation of said disc, thereby to provide a skimming flow port;
  a vacuum hose coupler fitting on said seat and having a mouth opening through said seat; and
  a vacuum hose opening in said valve disc adapted to register with said mouth to receive the end of a vacuum hose, the circumferentially positional relation of said vacuum hose opening to said skimmer opening of said valve disc being so related to the circumferentially positional relation of said vacuum hose mouth to said skimming flow opening of said valve seat that said mouth will register with said vacuum hose opening in a position of said valve in which said skimming flow port is at least largely closed; whereby suction developed in said lower chamber is applied to the vacuum hose coupled to said fitting.

2. A skimmer as defined in claim 1, wherein said valve and seat are of inverted pan form, each having a substantially cylindrical rim provided with a skimming flow opening in the form of a circumferential slot.

3. A skimmer as defined in claim 1, including means in said housing defining a lateral chamber communicating laterally with said lower chamber;

  a main drain connection below said lateral chamber on a vertical axis having an upper end defining a valve seat in said lateral chamber and communicating therewith through the bottom thereof;
  a plug valve disposed in said lateral chamber and having an end adapted to engage said seat to shut off communication between said main drain connection and said lower chamber;

and means to hold said plug valve against said seat.

4. A skimmer as defined in claim 1, including an equalizer inlet in the bottom of said lower chamber; and an equalizer valve comprising a poppet normally covering said equalizer inlet, said poppet having a hub boss; a bracket arm overhanging said poppet; a compression spring engaged between said arm and said poppet boss; and a lockout arm mounted for swinging movement to a position where its end is engaged over said boss to hold said poppet seated over said inlet.
5. A swimming pool skimmer comprising, in combination:
   a housing having a skimming inlet, an upper chamber communicating with said inlet; a lower chamber, and partition means separating said chambers, said partition means including a circular valve seat having a skimming flow opening;
   a valve disc rotatable on said seat, said disc having an opening adapted to register with said seat opening in a selected open position; or rotation of said disc, thereby to provide a skimming flow port;
   a vacuum hose coupler fitting on said seat and having a mouth opening through said seat;
   a vacuum hose opening in said valve disc adapted to register with said mouth to receive the end of a vacuum hose in a position of said valve in which said skimming flow port is at least largely closed; whereby suction developed in said lower chamber is applied to the vacuum hose coupled to said fitting;
   means in said housing defining a lateral chamber communicating laterally with said lower chamber;
   a main drain connection having an end defining a valve seat in said lateral chamber and communicating therewith;
   a plug valve disposed in said lateral chamber and having an end adapted to engage said seat to shut off communication between said main drain connection and said lower chamber;
   and means to hold said plug valve against said seat;
   said main drain connection communicating with said lateral chamber through the bottom thereof on a vertical axis and having its said seat at its upper end, within said lateral chamber;
   said plug valve having means for supporting it in an elevated position in which said lateral chamber communicates with said lower chamber.

6. A skimmer as defined in claim 5, wherein said partition means extends across said lateral chamber and has an opening to receive said plug valve;
   said plug valve supporting means comprising radial lugs on the sides of said plug valve, engageable above said partition means;
   said opening in the partition means having radial extensions through which said lugs may be passed to seat said plug valve on its said seat.

7. A skimmer as defined in claim 6, wherein said means to hold said plug valve against its seat is an integral part of the under side of said partition means adjacent the periphery of said plug valve opening therein.

8. A skimmer as defined in claim 7, said means to hold said plug valve against its seat being a circumferential land having a ramp at its end adjacent said opening extension.