SYSTEM FOR TURNING OFF POWER TO POOL EQUIPMENT UPON THE DETECTION OF A DROP IN WATER LEVEL

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ABSTRACT

Some embodiments of the present invention include a concealed system for preventing water being supplied into a pool upon a detection of a predetermined drop in water level in the pool. The system may include a controller capable of detecting the predetermined drop in water level, the controller being configured to interrupt a circuit that provides power to a pool pump and a water supply valve upon detection of the drop in water level. The predetermined drop in water level may correspond to the drop of the water level from an acceptable range to an unacceptable range, the acceptable range having a greater depth than the unacceptable range. The float switch may be situated within a water leveler container, which may be positioned within a pool deck so as to be concealed from view.
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BACKGROUND

[0001] The embodiments herein relate generally to pool equipment and, more particularly, to a control system that shuts down the pool pump and the water leveler when the water in a pool drops too low.

[0002] Many variables can cause the water to partially or completely drain unintentionally from a pool. For example, the water may drain due to equipment failure, such as a broken pipe, a broken pipe fitting, a filter blowing out, or a broken chlorine generator. When the water drains out of the pool, it not only results in the loss of water, requiring a user to refill the pool, but it can also cause damage by flooding yards and nearby structures. The draining of the water can cause damage to the pool and other pool equipment as well, an example being a pool motor. The damage caused to any equipment or land could potentially be quite costly to repair. For example, when the water drains out of a plasier pool and the pool shell dries out, repairing the pool may cost a considerable amount.

[0003] Many pools now have automatic water fillers, providing water back into the pool when the water level drops. However, these automatic fillers do not detect whether the pool is draining because of some sort of equipment failure rather than mere evaporation. Thus, if a pool is draining because of a failure, such as a burst pipe, the automatic water filler may constantly provide water to the pool in an attempt to fill the pool back up to the desired level, while the pool just continues to empty.

[0004] Therefore, what is needed is a system that turns the power to the pump and water leveler equipment off when a drop in the water level is detected.

SUMMARY

[0005] Some embodiments of the present invention include a concealed system for preventing water being supplied into a pool upon a detection of a predetermined drop in water level in the pool. The system may include a controller capable of detecting the predetermined drop in water level, the controller being configured to interrupt a circuit that provides power to a pool pump and a water supply valve upon detection of the drop in water level. The predetermined drop in water level may correspond to the drop of the water level from an acceptable range to an unacceptable range, the acceptable range having a greater depth than the unacceptable range. The float switch may be situated within a water leveler container, which may be positioned within a pool deck so as to be concealed from view.

BRIEF DESCRIPTION OF THE FIGURES

[0006] The detailed description of some embodiments of the invention is made below with reference to the accompanying figures, wherein like numerals represent corresponding parts of the figures.

[0007] FIG. 1 is a schematic view of one embodiment of the present invention.

[0008] FIG. 2 is a side section view of one embodiment of the present invention installed in an exemplary setting.

DETAILED DESCRIPTION OF CERTAIN EMBODIMENTS

[0009] In the following detailed description of the invention, numerous details, examples, and embodiments of the invention are described. However, it will be clear and apparent to one skilled in the art that the invention is not limited to the embodiments set forth and that the invention can be adapted for any of several applications.

[0010] The system of the present disclosure may be used to turn off the power to the pool pump and the automatic water filler upon detection of a drop in the level of the water and may comprise the following elements. This list of possible constituent elements is intended to be exemplary only, and it is not intended that this list be used to limit the system of the present application to just these elements. Persons having ordinary skill in the art relevant to the present disclosure may understand there to be equivalent elements that may be substituted within the present disclosure without changing the essential function or operation of the system.

1. Controller
2. Relay
3. Transformer
4. Water Leveler

[0011] The various elements of the system for turning off the power to pool equipment upon detection of a drop in the level of water of the present disclosure may be related in the following exemplary fashion. It is not intended to limit the scope or nature of the relationships between the various elements and the following examples are presented as illustrative examples only.

[0012] By way of example, and referring to FIGS. 1 and 2, one embodiment of the present invention comprises a controller 16 electrically connected to a transformer 14, which is electrically connected to a power relay 12 that provides power to a water supply valve 18. The circuit may also include a timer 10, which is preset by a user to schedule regular pumping of and water supply to the pool. The timer 10 and the relay 12 may be housed in a container 30, which may protect the timer 10 and the relay 12 from environmental elements.

[0013] In embodiments, when the controller 16 detects a drop in the water level 38 of the pool from an acceptable depth range to an unacceptable depth range, the controller 16 interrupts, or breaks, the circuit to the power relay 12 and the transformer 14, thus turning off the power to the pool pump 22 and the water supply valve 18. In other words, when the water level 38 of the pool falls within an acceptable depth range, the pool pump 22 and the water supply valve 18 may supply additional water to the pool. When the water level 38 of the pool falls within an unacceptable depth range, which has a depth less than the acceptable range, the circuit may be deactivated to prevent the pool pump 22 from operating and the water supply valve 18 from supplying additional water to the pool. In embodiments, the controller 16 may also be able to detect an ideal water level range, which is greater than both the acceptable depth range and the unacceptable depth range. The controller 16 may also interrupt the circuit to the pool pump 22 and the water supply valve 18 when the water level falls within the ideal water level range. Thus, the controller 16...
may activate the circuit when the water level falls within the acceptable water level range, resulting in additional water being added to the pool.

[0014] In embodiments, the entire system is concealed from view. For example, the controller 16 may be positioned within a water leveler container. For in-ground pools, the water leveler may be situated proximate to the pool and within the pool deck 24, such that the water leveler and the controller 16 are concealed from view. A water supply line 20 may run concealed under the ground level 34 from a water shut off valve 36 to the pool. For above-ground pools, the water leveler may be attached to the side of the pool. In embodiments, the controller 16 may be a float switch.

[0015] When the water level 38 in the pool drops from an acceptable level to an unacceptable level, the water in the water leveler may also drop from the acceptable level to the unacceptable level. When the change is greater than a predetermined change in water levels, the controller 16 will interrupt the circuit. For example, the controller 16 may be a float switch including a float. When the water level is at an acceptable level, the float completes the circuit, allowing power to flow freely to the pool pump 22 and the water supply valve 18. When the water level drops to an unacceptable water level, the float drops with the water level, causing a break in the circuit and cutting off power to the pool pump 22 and the water supply valve 18. The necessary drop in the water level to interrupt the circuit may differ depending on the pool and the pool equipment used with the pool. For example, if a sand filter is used to filter the pool water, the system may need to be set for a larger drop in water level being required to interrupt the circuit. In some embodiments, the water level may need to drop at least about ½ inch to interrupt the circuit, while in other embodiments, the water level may need to drop at least about 1 inch to interrupt the circuit. Still in further embodiments, the water level may need to drop at least about ½ inches to interrupt the circuit.

[0016] FIG. 2 shows one embodiment of the system installed in an exemplary system. As shown in FIG. 2, a structure 28, such as a house, may have a water shut off valve 36 from which water flows through a water supply line 20 to a pool. The pool deck 24 includes a container housing the float switch 16, such that the float switch 16 is not visible from the surface of the pool deck 24. Additionally, the wiring necessary to electrically connect all components of the system may be concealed by, for example, embedding the wiring in the pool deck 24. When the float switch 16 drops a predetermined amount or more, corresponding to the water level dropping into the unacceptable depth range, the power to the pump 22 and a water supply valve, such as a solenoid water valve, is shut off, preventing more water from being pumped into the draining, or already completely drained, pool.

[0017] Some embodiments of the system include an alert system. The alert system may alert a user when the water level has dropped causing the float switch to interrupt the power circuit. In embodiments, the alert system may provide an audible alert, such as an alarm, or a visual alert, such as a light. Any suitable alert system may be implemented with the system of the present invention. For example, in some embodiments, the alert system includes a sounding device, which may produce a buzz, beep, or other audible sound, that is wired into the power relay and thus electrically connected to the controller. When the water level drops to an unacceptable water level and the controller breaks the circuit to the pool equipment, the controller may complete a circuit to the sounding device, resulting in the sounding device producing its alerting sound.

[0018] Persons of ordinary skill in the art may appreciate that numerous design configurations may be possible to enjoy the functional benefits of the inventive systems. Thus, given the wide variety of configurations and arrangements of embodiments of the present invention the scope of the invention is reflected by the breadth of the claims below rather than narrowed by the embodiments described above.

What is claimed is:

1. A system for deactivating a circuit providing power to pool equipment upon detection of a drop in water level of a pool from an acceptable water level to an unacceptable water level, the system comprising:
   a controller electrically connected to the pool equipment, the controller detecting whether the water level falls within a first depth range or a second depth range, wherein the controller deactivates the circuit that provides power to the pool equipment when the water level falls within a second depth range, wherein:
   i. the first depth range corresponds to the acceptable water level and the second depth range corresponds to the unacceptable water level;
   ii. the acceptable water level has a greater depth than the unacceptable water level; and
   iii. the circuit is deactivated, or is prevented from being pumped out of the pool by the pool equipment.

2. The system of claim 1, wherein the controller is a float switch.

3. The system of claim 1, wherein:
   i. the pool equipment comprises a pool pump and a water supply valve; and
   ii. the controller is electrically connected to a power relay, which is electrically connected to the water supply valve.

4. The system of claim 1, wherein the system is concealed from view.

5. The system of claim 1, wherein a largest depth of the unacceptable water level is about 1 inch less than a largest depth of the acceptable water level.

6. The system of claim 1, further comprising an alert system, the alert system configured to produce an alert when the circuit that provides power to the pool equipment is broken.

7. A concealed system for preventing water being added to a pool upon detection of a predetermined drop in water level in the pool, the system comprising:
   a controller capable of detecting the predetermined drop in water level, the controller being configured to interrupt a circuit that provides power to a pool pump and a water supply valve upon detection of the predetermined drop in water level, wherein:
   i. the predetermined drop in water level corresponds to the drop of the water level from an acceptable range to an unacceptable range, the acceptable range having a greater depth than the unacceptable range; and
   ii. the controller is situated within a water leveler container, the water leveler container being positioned within a pool deck so as to be concealed from view.

8. The system of claim 7, wherein a greatest depth of the unacceptable range is about 1 inch less than a greatest depth of the acceptable range.
9. The system of claim 7, wherein:
   water is added into the pool when the water level is within
   the acceptable range; and
   water is not added into the pool when the water level is
   greater than the acceptable range or when the water level
   is within the unacceptable range.

10. The system of claim 7, further comprising an alert
    system, the alert system configured to produce an alert when
    the circuit that provides power to the pool pump and the water
    supply valve is broken.