ABSTRACT

The embodiments herein provide a security system for a water body. The system includes a reticular structure arranged on a ground level, an electromotor, an electro hydraulic circuit with a plurality of hydraulic components placed in the water body, a central controlling unit, and a remote controller. A pressing operation of the remote controller transfers a command to the central controlling unit which in turn sends a control command to the plurality of hydraulic components to arrange the reticular structure at a required height in the water body. The reticular structure is moved vertically in a direction along the depth/height of the water body to a desired height based on the requirements. A wristband with a sensor worn by a swimmer measures the pulse rate and outputs an alarm to control unit to move the reticular structure to safe level, when the measured pulse rate exceeds a threshold value.
SECURITY SYSTEM FOR ARTIFICIAL WATER BODIES

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application is a continuation-in-part (CIP) application filed in continuation of the application with Ser. No. 13/098,416 filed on Apr. 30, 2011 with the title, "SECURITY SYSTEM FOR ARTIFICIAL WATER BODIES", and the contents of which is incorporated in entirety as reference herein. The application claims the benefit of the U.S. Provisional Patent application with Ser. No. 61/423,603 filed on Dec. 16, 2010 and the contents of which is incorporated herein by reference in its entirety.

BACKGROUND

[0002] 1. Technical field

[0003] The embodiments herein generally relate to a security system and particularly relate to the security system for artificial water bodies such as swimming pools. The embodiments herein more particularly relates to a swimming pool cover assembly and a movable board positioned over at any elevation inside swimming pool to prevent drowning of users.

[0004] 2. Description of the Related Art

[0005] Often children die in the swimming pools because of either not being familiar with swimming or other factors such as falling suddenly in the swimming pool filled completely with water or empty pools. Further the swimming pools need to be changed to safe areas in which no child dies due to playfulness and no adult dies due to lack of knowledge of swimming or falling in pools. Also there is no opportunity to save the person quickly, even if a person is injured because of dropping into the swimming pools.

[0006] Numerous swimming pool covers have been devised for covering the swimming pools during periods when they are not in use, to keep out children and animals that might fall in and get drowned, to keep out dust, dirt and leaves during the unused periods and to preserve the cleanliness of the pool. These pool covers are of the types such that they are usually positioned over the pool, attached to the anchors, secured in places by laces, or provided with a continuous tube filled with water attached to the cover along its border and holding the cover slackly in place. However these covers are heavy, difficult to adjust, difficult to handle, take a long time to fill and a long time to empty.

[0007] Hence there is a need for a security system provided with a movable cover having an adjustable mechanism to move the cover to different depths to provide water pool of desired depths in accordance with a plurality of requirements. There also exists a security system provided with a movable reticular board which encloses the water body to prevent debris, dust, etc., from accumulating in the pool. Moreover, there exists a need for a security system provided with a movable reticular board which is adapted to convert the pool into a multi-utility area when the pool is not in use. Further there is a need for a security system which responds to the measured vital signs of a swimmer to provide safety and security to the swimmer and to save his life in case of emergency. Still further there is a need for a security system provided with a movable floating surface to provide a ground for any gaming activity or sports in the pool.

[0008] The abovementioned shortcomings, disadvantages and problems are addressed herein and which will be understood by reading and studying the following specification.

OBJECTS OF THE EMBODIMENTS

[0009] The primary object of the embodiments herein is to provide a security system with a reticular structure arranged on a ground level in a water body for the safety of the users.

[0010] Another object of the embodiments herein is to provide a security system with a reticular structure which is held rigidly at any desired positions within a swimming pool.

[0011] Yet another object of the embodiments herein is to provide a security system with a reticular structure to prevent a drowning of the users in the water body.

[0012] Yet another object of the embodiments herein is to provide a security system with a reticular structure having an adjustable mechanism to adjust the height of the reticular structure in the water body according to the requirements.

[0013] Yet another object of the embodiments herein is to provide a reticular structure with the appropriate dimensions to cover the open surface area of the water body when the water body is not in use.

[0014] Yet another object of the embodiments herein is to provide a security system for the water body which is flexible and cost effective.

[0015] Yet another object of the embodiments herein is to provide a security system with a reticular structure to prevent a danger caused by the empty water bodies to the users.

[0016] Yet another object of the embodiments herein is to provide a security system with a reticular structure to provide an option to determine a depth level at which the user wants to swim and change the depth level of the reticular structure inside the swimming pool accordingly.

[0017] Yet another object of the embodiments herein is to provide a security system with a reticular structure so that the cover/reticular structure is maneuvered in to an earlier position after the use.

[0018] Yet another object of the embodiments herein is to provide a durable security system which is economical to manufacture, attractive in appearance, and which is effective in preventing debris and trash from entering the water body.

[0019] Yet another object of the embodiments herein is to provide a security system which is moved based on the measured vital signs of the swimmer to protect the swimmer from danger and to safeguard the life of the swimmer in case of emergency.

[0020] Yet another object of the embodiments herein is to provide a security system provided with a movable board without any reticular surface to provide a surface for any gaming activity or sports activity.

[0021] These and other objects and advantages of the embodiments herein will become readily apparent from the following detailed description taken in conjunction with the accompanying drawings.

SUMMARY

[0022] The embodiments herein provide a security system for a water body. The system includes a reticular structure arranged at a level parallel to the level of water in the water body, an electromotor, and an electro hydraulic circuit with a plurality of hydraulic components placed in the water body. The system further includes a central controlling unit and a remote controller. A pressing operation of the remote control-
ler transfers a command to the central controlling unit which in turn sends a control command to the plurality of hydraulic components to adjust a height of the reticular structure to a desired level based on the requirements. The reticular structure is moved vertically in a direction along the depth of the water body to achieve a required height according to the requirements.

[0023] According to an embodiment herein, the reticular structure is provided with a shape equivalent to the shape of the water body.

[0024] According to an embodiment herein, the desired height at which the reticular structure is placed is preset by a user.

[0025] According to an embodiment herein, the reticular structure is moved vertically in direction along the depth of the water body to adjust a height according to the requirements of the user.

[0026] According to an embodiment herein, the reticular structure is moved to the top of the water body by sending commands through the remote controller such that the board covers the open surface area of the water body when the water body is not in use and is in place with a ground level.

[0027] According to an embodiment herein, the security system includes a lift engine to adjust the movement of the reticular structure in the water body.

[0028] According to an embodiment herein, the reticular structure is made of a composite plastic and steel woven in a lattice network.

[0029] According to an embodiment herein, the remote controller includes a transmitter and a receiver.

[0030] According to an embodiment herein, the transmitter transmits the commands to the receiver when the button is pressed in the remote controller. The receiver of the remote controller transmits the commands received to a relay through encoding.

[0031] According to an embodiment herein, the plurality of hydraulic components in the electro hydraulic circuit includes at least one hydraulic pump, a plurality of pressure relief valves, at least one hydraulic jack, a control balance valve, at least one direction control valves and at least one counter balance valves.

[0032] According to an embodiment herein, the at least one hydraulic pump include a gear pump and a piston pump.

[0033] According to an embodiment herein, the at least one hydraulic jacks is a telescopic jack.

[0034] According to an embodiment herein, the at least one counter balance valves controls the jack rate created by the at least one hydraulic jack in the water body.

[0035] According to an embodiment herein, the at least one direction control valve regulates the direction of hydraulic movements in the water body.

[0036] According to an embodiment herein, the plurality of pressure relief valves releases the pressure created due to the hydraulic movements in the water body.

[0037] According to an embodiment herein, the security system includes a control feedback system to control and equalize the velocity of the one or more hydraulic jacks in the water body.

[0038] According to an embodiment herein, the reticular board is made of a single integrated structure or made of plurality of boards connected flexibly so that the plurality of boards in the reticular are positioned at different elevations and adapted to adhered to a shape, contour and design of the bottom floor of the swimming pool.

[0039] According to an embodiment herein, the system is provided with a wrist band mounted with a sensor for measuring a vital sign of a swimmer. The vital sign is a pulse rate of the swimmer. The wrist band is designed to be worn at a wrist of the swimmer to measure a pulse rate of the swimmer.

[0040] According to an embodiment herein, the sensor mounted at the wrist band outputs an alarm signal to the central controlling unit to send the control commands to the plurality of hydraulic components to move the reticular structure to save a life of the swimmer, when the measured pulse rate of the swimmer exceeds a threshold value.

[0041] According to an embodiment herein, a swimmer is provided with a wrist band to control a pulse rate of the swimmer.

[0042] According to an embodiment herein, the sensor at the wrist band outputs a signal to the remote controller to activate the remote controller to move the reticular board to a safe level and wherein the safe level corresponds to a ground level outside the swimming pool, and wherein the sensor outputs an infrared signal to the remote controller.

[0043] According to an embodiment herein, a movable floating surface is arranged on a ground level of the swimming pool, and wherein the movable floating surface is a reticular structure arranged on the ground level.

[0044] According to an embodiment herein, the movable floating surface is a non reticular structure arranged on the ground level, and wherein the movable floating surface is designed to provide a ground for a gaming activity or sport activity.

[0045] These and other objects and advantages of the embodiments herein will become readily apparent from the following detailed description taken in conjunction with the accompanying drawings.

[0046] These and other aspects of the embodiments herein will be better appreciated and understood when considered in conjunction with the following description and the accompanying drawings. It should be understood, however, that the following descriptions, while indicating preferred embodiments and numerous specific details thereof, are given by way of illustration and not of limitation. Many changes and modifications may be made within the scope of the embodiments herein without departing from the spirit thereof, and the embodiments herein include all such modifications.

**BRIEF DESCRIPTION OF THE DRAWINGS**

[0047] The other objects, features and advantages will occur to those skilled in the art from the following description of the preferred embodiments and the accompanying drawings in which:

[0048] FIG. 1 illustrates a perspective view of a security system with a reticular structure arranged at a bottom ground level in a water body, according to one embodiment herein.

[0049] FIG. 2 illustrates a perspective view of a security system with a reticular structure positioned at a desired in a water body, according to one embodiment herein.

[0050] FIG. 3 illustrates a perspective view of a security system with a reticular structure arranged at a water level on the top of the water body, according to one embodiment herein.

[0051] FIG. 4 illustrates a block circuit diagram of an electro hydraulic circuit in the security system, according to an embodiment herein.
FIG. 5 illustrates a perspective view of a transmitter in the remote controller of the security system, according to an embodiment herein.

FIG. 6 illustrates a perspective view of a receiver in the remote controller of the security system, according to an embodiment herein.

FIG. 7 is a schematic block diagram of a management system for controlling a range of motion of the jacks, according to an embodiment herein.

FIG. 8 is a pictorial representation of a telescopic jack in the security system, according to an embodiment of the present disclosure.

FIG. 9 illustrates a schematic block circuit diagram of an electro-hydraulic circuit in the security system, according to an embodiment herein.

FIG. 10 illustrates a block circuit diagram of a PLC input-output circuit in the security system, according to an embodiment herein.

FIG. 11 illustrates a ladder diagram of a PLC input-output circuit in the security system applied with rational control algorithms, according to an embodiment of the present disclosure.

Although the specific features of the embodiments herein are shown in some drawings and not in others. This is done for convenience only as each feature may be combined with any or all of the other features in accordance with the embodiment herein.

DETAILED DESCRIPTION OF THE EMBODIMENTS

In the following detailed description, a reference is made to the accompanying drawings that form a part hereof, and in which the specific embodiments that may be practiced is shown by way of illustration. These embodiments are described in sufficient detail to enable those skilled in the art to practice the embodiments and it is to be understood that the logical, mechanical and other changes may be made without departing from the scope of the embodiments. The following detailed description is therefore not to be taken in a limiting sense.

The embodiments herein provide a security system for a water body. The system includes a reticular structure arranged at a level parallel to the level of water in the water body, an electromotor, and an electro-hydraulic circuit with a plurality of hydraulic components placed in the water body. The system further includes a central controlling unit and a remote controller. A pressing operation of the remote controller transfers a command to the central controlling unit which in turn sends a control command to the plurality of hydraulic components to adjust a particular height of the reticular structure according to the requirements. The reticular structure is moved vertically in a direction along the depth of the water body to the required height according to the requirements.

According to an embodiment herein, the reticular structure is provided with a shape equivalent to the shape of the water body.

According to an embodiment herein, the required height at which the reticular structure is placed is predetermined by a user.

According to an embodiment herein, the reticular structure is moved vertically in direction along the depth of the water body to a desired height according to the requirements of the user.

According to an embodiment herein, the reticular structure is moved towards the top of the water body by sending commands through the remote controller such that the board covers the open surface area of the water body when the water body is not in use.

According to an embodiment herein, the security system includes a lift engine to control the movement of the reticular structure in the water body.

According to an embodiment herein, the reticular structure is made of a composite plastic and steel woven in a lattice network.

According to an embodiment herein, the remote controller includes a transmitter and a receiver.

According to an embodiment herein, the transmitter transmits the commands to the receiver when the button is pressed in the remote controller. The receiver of the remote controller transmits the commands received to a relay through encoding.

According to an embodiment herein, the plurality of hydraulic components in the electro-hydraulic circuit includes at least one hydraulic pump, a plurality of pressure relief valves, at least one hydraulic jack, a control balance valve, at least one direction control valves and at least one counter balance valves.

According to an embodiment herein, the at least one hydraulic pump include a gear pump and a piston pump.

According to an embodiment herein, the at least one hydraulic jacks is a telescopic jack.

According to an embodiment herein, the at least one counter balance valves controls the jack rate created by the at least one hydraulic jack in the water body.

According to an embodiment herein, the at least one direction control valve controls the direction of hydraulic movements in the water body.

According to an embodiment herein, the plurality of pressure relief valves releases the pressure created due to the hydraulic movements in the water body.

According to an embodiment herein, the security system includes a control feedback system to control and equalize the velocity of the one or more hydraulic jacks in the water body.

According to an embodiment herein, the system is provided with a wrist band mounted with a sensor for measuring a vital sign of a swimmer. The vital sign is a pulse rate of the swimmer. The wrist band is designed to be worn at a wrist of the swimmer to measure a pulse rate of the swimmer.

According to an embodiment herein, the sensor mounted at the wrist band outputs an alarm signal to the central controlling unit to send the control commands to the plurality of hydraulic components to move the reticular structure to save a life of the swimmer, when the measured pulse rate of the swimmer exceeds a threshold value.

According to an embodiment herein, the sensor at the wrist band outputs a signal to the remote controller to activate the remote controller to move the reticular board to a safe level and wherein the safe level corresponds to a ground level outside the swimming pool, and wherein the sensor outputs an infra red signal to the remote controller.

According to an embodiment herein, a swimmer is provided with a wrist band to control a pulse rate of the swimmer.

According to an embodiment herein, a movable floating surface is arranged on a ground level of the swin-
ming pool, and wherein the movable floating surface is a reticular structure arranged on the ground level.

A pulse rate is an important vital sign of life in human being. Also, the number of pulse rate per minute is vital in that it shows the health of a person. Some of the factors that affect the number of pulses are age, daily activity and a position of a person. The pulse rate of the children, adults, and the elderly are not the same and are different. Similarly the pulse rate of a person varies with respect to an activity such as sleeping, walking, running, exercising and eating etc. Further the pulse rate of a person is varied with a position of person, such as a relaxed position. As a result, there are maximum and minimum pulse rates for each people depending the activity, position and age.

For instance, a pulse rate for a person should normally be 50 to 100 beat per minute. During sleep, the pulse rate reaches the minimum level, but not less than 50 beat per minute. While exercising, the pulse rate reaches the maximum level, but not more than 150 beat per minute. While relaxing, athletes have 50 to 70 beat per minute.

According to an embodiment herein, the wristband that the swimmer wears controls his pulse constantly. When the pulse rate goes beyond the limits modified to the wristband, the wristband alarms the central control system. Then, the floating surface moves upward as soon as the alarm goes off.

According to an embodiment herein, the sensor at the wristband outputs a signal to the remote controller to activate the remote controller to move the reticular board to a safe level and wherein the safe level corresponds to a ground level outside the swimming pool, and wherein the sensor outputs an infra red signal to the remote controller.

According to an embodiment herein, the sensor is provided with a Infra Red (IR) signal generator to output an IR signal when the measured pulse rate exceeds a threshold value.

According to an embodiment herein, the floating surface is designed to be not reticular and without any deficiency for the system function. Not being reticular and uniformity of the floating surface has some privileges comparing to the reticular ones.

For example, when this moving floating surface is in the utmost level (the ground level), the blocked surface of the pool is easily, optimally and effectively used for other activities such as sports activities.

FIG. 1 illustrates a perspective view of a security system with a reticular structure arranged on a ground level in a water body, according to one embodiment herein. With respect to FIG. 1, the security system includes a water body 102 with a plurality of jacks 106 installed to control the direction of movement of a reticular structure 104. The reticular structure 104 is a rectangular board provided with the flexibility required to align with the shape of the water body. The reticular structure 104 as shown in FIG. 1 is aligned with the bottom of the water body. The particular height at which the reticular structure 104 is placed is predetermined by a user. The reticular structure is made of composites and lattices which are joined by joints. The force determined for each square meter is 3000 N/m². The force is calculated by a security factor of 3 and also the water pressure.

FIG. 2 illustrates a perspective view of a security system with a reticular structure arranged at a desired height in a water body, according to one embodiment herein, while FIG. 3 illustrates a perspective view of a security system with a reticular structure arranged at a water level on the top of the water body, according to an embodiment herein. With respect to FIG. 2 and FIG. 3, the security system includes the reticular structure 104 with a plurality of jacks 106 installed to control the direction of movement of the reticular structure 104. The reticular structure 104 is moved vertically in a direction along the depth/height of the water body 102 to a desired height according to the requirements of the user. The particular height at which the reticular structure 104 is placed is predetermined by a user. The user adjusts the height of the reticular structure 104 by pressing a button in a remote controller. The pressing operation by the user results in transferring a command to a central controlling unit. The central controlling unit receives the command and sends a control command to the plurality of hydraulic components to a desired height of the reticular structure 104 according to the requirements. The reticular structure 104 includes physical characteristics to permit the flow of water across the reticular structure 104 resulting in the movement towards the highest point in the water body as shown in FIG. 2. The reticular structure 104 is moved towards the top of the water body 102 by sending commands through the remote controller such that the reticular structure 104 covers the open surface area of the water body 102 when the water body 102 is not in use as shown in FIG. 3.

FIG. 4 illustrates a block circuit diagram of an electro hydraulic circuit in the security system, according to an embodiment herein. The electro hydraulic circuit includes a plurality of hydraulic components. The plurality of hydraulic components includes at least one hydraulic pump 402, an electromotor 404, at least one discharge divider 406, at least one hydraulic jack, at least one direction control valve 408, a plurality of pressure relief valves, a control balance valve, and at least one counter balance valve. The hydraulic pump 402 is connected to the electromotor 404 and provides the discharge needed by the four hydraulic jacks. The discharge is divided equally by the discharge dividers 406 into four for equalizing the velocity of the hydraulic jacks. Further the direction of the jacks is controlled by the direction control valves 408. The electro hydraulic circuit is simulated by automation studio software.

The hydraulic pumps 402 require a driving force to provide the needed torque of the circuit. This torque should be supplied by the electromotor 404. Further all the hydraulic pumps 402 used in high pressure hydraulics are positive displacement pumps. The ability to provide high pressure without reducing the output rate is the main characteristic of the hydraulic pumps 402. The hydraulic pumps 402 used in the present system include a gear pump and a piston pump. The gear pump includes two gears which are meshed with each other and are sealed in a close case. Further as the axle that is connected to one of the gears rotates, the suction occurs on one side, and discharge occurs on the other side. The piston pump includes an oblique plate that is connected to the end of a piston axle. Further a full round rotation of the oblique plate changes the position of the piston from suction to discharge.

The security system also includes a controlling system for controlling the revolution of the electromotor 404.
The revolution of the electro motor 404 is controlled through frequency inverters. The frequency converters are used when there is a need to achieve the maximum revolution of the electric motors. Further as the electromotor 404 starts working a sudden movement of the pump may strike the jack and by using revolution control inverters, the motor revolution is accelerated with a pacific slope. The changing frequency and voltage is the basis of inverters function in a way that voltage or frequency ratio is kept constant. Further the motor torque is constant in different motor revolutions.

[0095] The discharge dividers 406 are precise hydraulic motors and have gears’ rotational speed equal to each others. Further when the fluid enters the hydraulic motors, the motors function in contrary to gear pumps. The rotation of one or more tandems which are in mesh with each other and also the connection of their spinning axis to each other leads to a passage of equal amount of discharge through each tandem. Further due to the tolerance between the gears and the cover, an amount of liquid leaks and as the speed of the gears increases, the discharge will be divided more precisely.

[0096] A circuit undesirably gets closed and consequently a part of the circuit gets ruptured because of high pressure. Further when the pressure exceeds limits during such an event it is necessary to use a plurality of pressure relief valves to create a path underpass. The plurality of pressure relief valves releases the pressure created due to the hydraulic movements in the water body. The pressure of relief valves is adjustable and their size depends on the circuit discharge.

[0097] The security system includes one or more direction control valves 408 to control the direction of movement of the plurality of jacks 106. The number of ports and the valves position is determined depending on the function of the security system. The size of the direction control valves 408 depends on the maximum discharge passing through the valves.

[0098] The security system also includes a plurality of counter balance valves. The plurality of counter balance valves are used to control the velocity of the plurality of the jacks 106 and are used in the direction of the load. The counter balance valves also obstruct the drain path to achieve the desired pressure required in the system.

[0099] The electro hydraulic circuit also includes an input and output equipment. The input and the output equipment include control valves that are connected to the output ports of the Programmable logic controllers (PLC). PLC is simple computer systems used in industrial environments and work with logic controlling algorithms. Further microprocessors used in PLC are simpler than PCs. The microprocessors in PLC receive the inputs through sensors by loading the program. After processing, the commands are sent to the operators through the output ports. The new PLCs are also capable of sending and receiving the DC analog signals. The security system also includes an emergency power supply system that has been contrived to provide energy of the system in emergency situations such as power outage or any other unexpected event. The emergency power supply system is a kind of a hybrid generator that works with gas or gas oil. Further when the fuel tank is in full charge mode, the generators continuously provide the power to run the security system.

[0100] FIG. 5 illustrates a pictorial representation of a transmitter in the remote controller of the security system, according to an embodiment of the present disclosure while FIG. 6 illustrates a pictorial representation of a receiver in the remote controller of the security system, according to an embodiment herein. With respect to FIG. 5 and FIG. 6, the remote controller includes a transmitter 502 and a receiver 602. The user operates the security system installed in the water body 102 by pressing the button in the transmitter of the remote controller. Further by pressing the buttons on the transmitter, the user transmits certain commands to the receiver as shown in FIG. 5.

[0101] The receiver 602 receives the radio waves from the transmitter 502 and transmits the commands to a relay through an encoder. The user then turns back the reticular structure in the security system to an earlier position by pressing a button which in turn avoids the drowning of the user in the water body 102. The remote controller is worn by the user on the wrist before entering the water body 102.

[0102] FIG. 7 is a schematic diagram illustrating a management system to control the range of motion of the jacks, according to an embodiment herein. The security system includes a central controlling unit 702. The central controlling unit 702 is capable of confining the range of motion of the plurality of jacks 106. The central controlling unit 702 confines access to various stages through three on/off switches. The various stages include a first stage 702, a second stage 704, and a third stage 706. The particular height at which the reticular structure 104 is placed is predetermined by the user. The user presses a button on the remote controller and the remote controller transfers a command to the central controlling unit. The central controlling unit 702 sends a control to the plurality of hydraulic components to adjust a particular height of the reticular structure 104 according to the requirements. Further the water flows through the reticular structure 104 resulting in the movement towards the highest point in the water body 102.

[0103] FIG. 8 is a pictorial representation of a telescopic jack in the security system, according to an embodiment of the present disclosure. The plurality of jacks used in the security system is a telescopic jack 802. The telescopic jack 802 in the security system is selected based on the jack load calculated. The calculations are listed below:

[0104] The dimensions of the floor in addition to live load is given by the below expression:

\[
F = 24 \text{ (m}^2\text{)} \times 150 \text{ (Kg/m}^2\text{)} = 3600 \text{ (Kg)}.
\]

\[
F' = 36000 \text{ (N)}.
\]

[0105] Further assuming that the applied load on each jack equals to the force applied and the expression is given below:

\[
36000 \text{ (N)} = 9000 \text{ (N)}.
\]

[0106] Therefore four prince jacks model are chosen for the security system.

[0107] The maximum input discharge to each jack is 50 LPM (restriction is because of output discharge of the cylinder as the jack is negative). The force of jack has been calculated based on plunger. Thereby the applied force by a jack in maximum pressure is given by the below expression:

\[
F_1 = 200 \times 5 \times 2.8 \times 3 \text{ (m}^2\text{)} = 45600 \text{ (N)}.
\]

[0108] Further during this situation the allowed course of the jack equals to 2.13 m and the applied force by a jack in minimum pressure is given by the below expression:

\[
F_2 = 70 \times 5 \times 2.8 \times 3 \text{ (m}^2\text{)} = 13960 \text{ (N)}.
\]
Further from the above expression, the allowed course of the jack equals to 3.98 m and the jack force will prevail over the load. Thus the telescopic jack is selected in the security system.

FIG. 9 illustrates a perspective view of an electro hydraulic circuit in the security system, according to an embodiment herein. With respect to FIG. 9, the electro hydraulic circuit 902 includes a control feedback system 904 for controlling and equalizing the velocity of jacks. Further there are many changes in electro hydraulic circuit in the first plan as shown in FIG. 4. The electric valves are replaced with servo type valves and a plurality of analog sensors is used with the plurality of jacks. Further more complicated controlling algorithms are used in the electro hydraulic circuit.

FIG. 10 illustrates a perspective view of a PLC input-output circuit in the security system, according to an embodiment herein. With respect to FIG. 10, a PLC input-output circuit 1002 includes four pressing buttons functioning as input and few of the buttons work manually and others are controlled from distance by radio waves. Further two of the switches are contrived to control the movements in reciprocating movement and also to control the construction from two separate locations.

FIG. 11 illustrates a perspective view of a ladder diagram on which rational control algorithms are applied, according to an embodiment of the present disclosure. With respect to FIG. 11, the ladder diagram 1102 displays a kind of program that is conducted in PLC processors. Further in this program the position of input command switches are checked and then the commands are transferred to one of the cards of direction control valves.

The various advantages of the present disclosure are to provide a security system with a reticular structure arranged on a ground level in a water body for safety of the users. Further the security system prevents drowning of the users in the water body by adjusting the height of the reticular structure according to the requirements. The reticular structure covers the open surface area of the water body when the water body is not in use which in turn prevents the user falling inside the water body. The construction of the reticular structure with the plurality of jacks in the water body is flexible and is cost effective. The user is also provided an option to determine a level that the user wants to swim and change the level accordingly. The security system is also helpful to provide hydrotherapy for elderly and disabled people and also children.

The foregoing description of the specific embodiments herein will so fully reveal the general nature of the embodiments herein that others can, by applying current knowledge, readily modify and/or adapt for various applications such specific embodiments herein without departing from the generic concept, and, therefore, such adaptations and modifications should and are intended to be comprehended within the meaning and range of equivalents of the disclosed embodiments. It is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation. Therefore, while the embodiments herein have been described in terms of preferred embodiments, those skilled in the art will recognize that the embodiments herein can be practiced with modifications within the spirit and scope of the appended claims.

Although the embodiments herein are described with various specific embodiments, it will be obvious for a person skilled in the art to practice the embodiments herein with modifications. However, all such modifications are deemed to be within the scope of the claims.

It is also to be understood that the following claims are intended to cover all of the generic and specific features of the embodiments described herein and all the statements of the scope of the embodiments which as a matter of language might be said to fall there between.

What is claimed is:
1. A security system for a water body, the system comprising:
   a movable floating surface arranged on a ground level, and
   wherein the movable floating surface is a reticular structure arranged on the ground level;
   an electromotor;
   a plurality of hydraulic components placed in the water body;
   an electro hydraulic circuit to control the plurality of hydraulic components;
   a central controlling unit;
   a remote controller;
   and
   a wrist band with sensor for measuring a vital sign of a swimmer, wherein a vital sign is a pulse rate of the swimmer and wherein the wrist band is designed to be worn at a wrist of the swimmer to measure a pulse rate of the swimmer;

Wherein a pressing operation of the remote controller transfers a command to the central controlling unit which in turn sends a control command to the plurality of hydraulic components to arrange the reticular structure at a required height in the water body, and wherein the reticular structure is moved vertically in a direction along the height of the water body to a required height based on a requirement, and wherein the sensor outputs an alarm signal to the central controlling unit to send the control commands to the plurality of hydraulic components to move the reticular structure to save a life of the swimmer, when the measured pulse rate of the swimmer exceeds a threshold value.

2. The system of claim 1, wherein the required height at which the reticular structure is placed is predetermined by a user.

3. The system of claim 1, wherein the reticular structure is moved towards a top surface of the water body by sending commands through the remote controller such that the reticular structure covers an entire open surface area of the water body when the water body is not in use.

4. The system of claim 1 further comprises a lift engine to adjust a movement of the reticular structure in the water body.

5. The system of claim 1, wherein the reticular structure is made of a composite plastic and steel woven in a lattice network.

6. The system of claim 1, wherein the remote controller comprises a transmitter and a receiver.

7. The system of claim 6, wherein the transmitter sends a command to the receiver when a button is pressed in the remote controller.

8. The system of claim 6, wherein the receiver of the remote controller transmits the received command to a relay through an encoder.

9. The system of claim 1, wherein the plurality of hydraulic components in the electro hydraulic circuit comprises:
   at least one hydraulic pump;
   a plurality of pressure relief valves;
   at least one hydraulic jack;
a balance control valve;
  at least one direction control valve; and
  at least one counter balance valve.
10. The system of claim 9, wherein the at least one hydraulic pump include a gear pump and a piston pump.
11. The system of claim 9, wherein the at least one hydraulic jack is a telescopic jack.
12. The system of claim 9, wherein the at least one counter balance valve controls the jack rate created by the at least one hydraulic jack in the water body.
13. The system of claim 9, wherein the at least one direction control valve controls a direction of hydraulic movement in the water body.
14. The system of claim 9, wherein the plurality of pressure relief valves releases a pressure created due to a hydraulic movement in the water body.
15. The system of claim 9 further comprises a control feedback system to control and equalize a velocity of the one or more hydraulic jacks in the water body.
16. The system according to claim 1, wherein the movable floating surface is a non reticular structure arranged on the ground level, and wherein the movable floating surface is designed to provide a ground for a gaming activity or sport activity.
17. The system according to claim 1, wherein the sensor at the wrist band outputs a signal to the remote controller to activate the remote controller to move the reticular board to a safe level and wherein the safe level corresponds to a ground level outside the swimming pool, and wherein the sensor outputs an infra red signal to the remote controller.