United States Patent

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[54] **SWIMMING POOL PROTECTION DEVICE**
4 Claims, 5 Drawing Figs.

[52] **U.S. Cl.** **4/172,** 138/27, 138/28
[51] **Int. Cl.** **E04h 3/16,** E04h 3/18
[50] **Field of Search** 4/172, 172.11, 172.12, 172.13, 172.14; 9/8; 114/219; 138/27, 28; 61/1; 119/3; 204/196

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ABSTRACT: A swimming pool protection device comprising a resilient, water-resistant, hollow casing enclosing a quantity of air and a quantity of ballast material in sufficient quantities and proportion to buoy the device in water in partially submerged, vertical position.

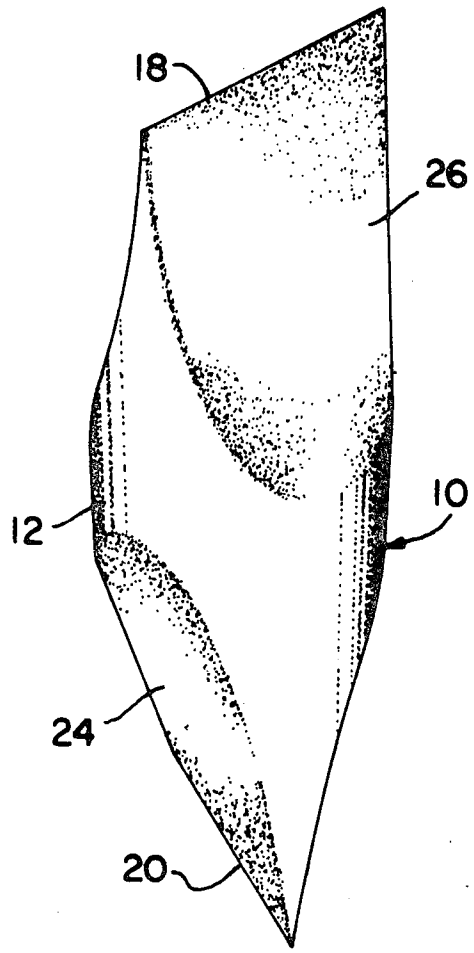


FIG. 1

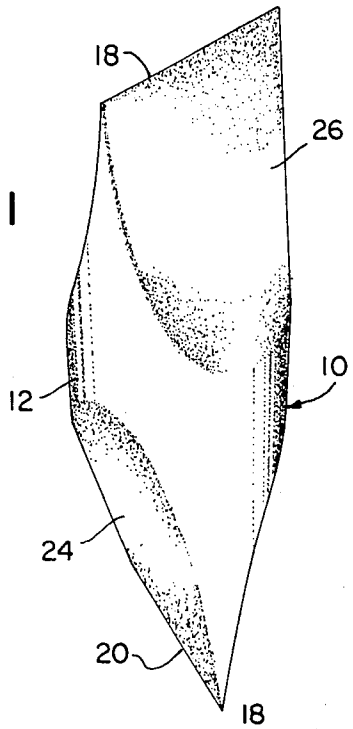


FIG. 2

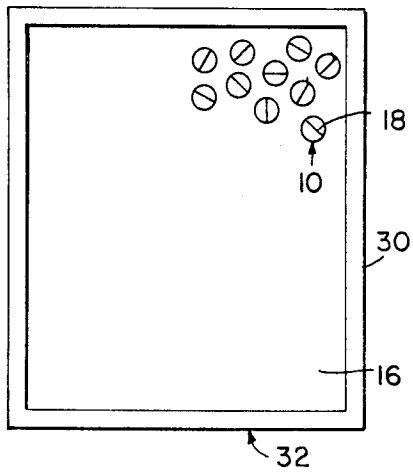


FIG. 4

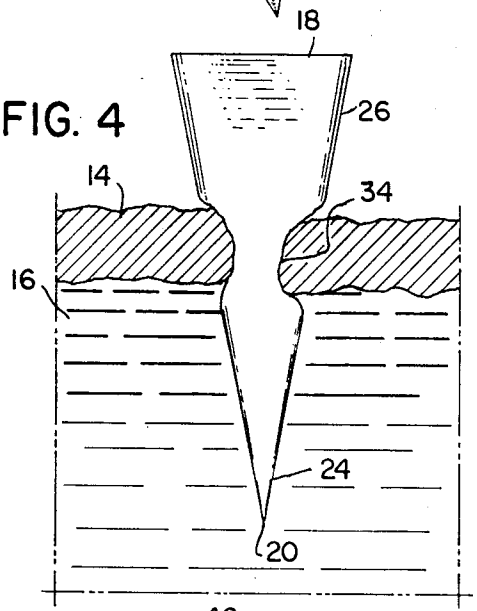


FIG. 3

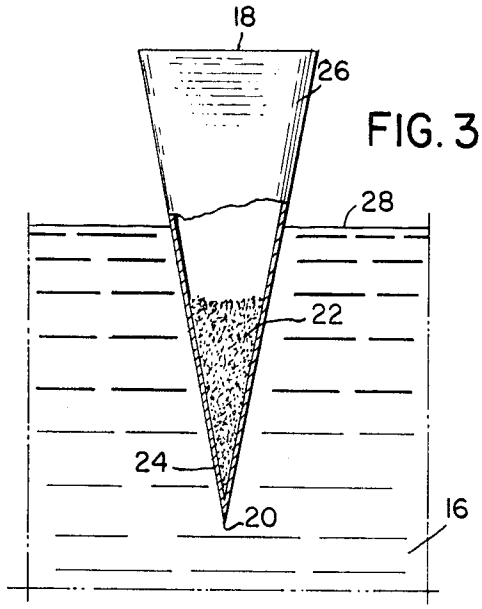
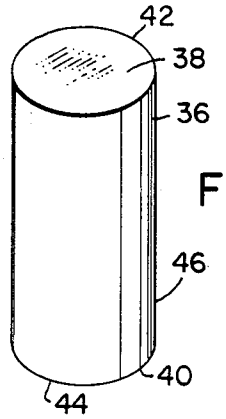


FIG. 5



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SWIMMING POOL PROTECTION DEVICE

BACKGROUND OF THE INVENTION

The present invention relates generally to the field of swimming pool maintenance equipment, and more particularly, is directed to a type of device capable of protecting the structural swimming members from damage caused by the formation of ice during periods of exposure to prolonged freezing temperatures.

The proper maintenance and protection of swimming pools during the winter months in northern climates has always posed a problem to swimming pool owners. Some owners have followed the policy of emptying the pool completely of water during the winter to thereby avoid the difficulties and possible damage caused by expansion forces generated by freezing of the water. This type of operation has generally proved unsatisfactory because solving of the one problem immediately gave rise to another. The very removal of the water from the interior of the pool however, served to create unusual stresses in the walls of the pool caused by the lateral forces of the adjacent earth acting inwardly against the swimming pool vertical surfaces. With water in the pool, such stresses would normally be counterbalanced by the forces generated by the retained water. However, removal of the water from the pool to prevent freezing also removes the effect of the water forces acting outwardly. Accordingly then, the unbalanced forces of the weight of earth pressing against the exterior of the pool walls in many cases were sufficient to cause cracking or buckling or other structural damage.

Other pool owners have attempted to solve the problem by allowing the water to remain in the pool throughout the year. During the winter months, logs were placed in the pool and allowed to float upon the surface of the water. The logs tended to retard the formation of ice upon the water surface of the swimming pool and further, absorbed certain compressive forces to thereby prevent damage to the walls of the pool due to there expansion of the ice against the sides. Such devices proved ineffective during extended periods of extremely cold weather wherein a hard freeze was likely to occur. Under such conditions, damage to swimming pool walls could occur whether or not logs were placed in the water.

SUMMARY OF THE INVENTION

The present invention relates to swimming pool protective devices, and especially to a manufactured, resilient body designed for buoyant positioning within the swimming pool.

The present swimming pool protection device includes a generally hollow, sealed, resilient container capable of being easily handled and being provided with sufficient ballast material to float the device in the pool in an upright position. A combination of air and yieldable ballast material, such as sand, is entrapped within the container to facilitate flexing of the container walls during periods of operation to absorb the expansion forces generated by the formation of ice. The sand or other yieldable ballast collects at the bottom of the device and serves to maintain an upright position when floating in water.

The combination of the entrapped air and the ballast serves to float the container upon the swimming pool water with portions of the resilient container carried above the water surface. Thus, in times of extremely cold weather when the swimming pool water surface freezes, the expansion forces of the ice compresses the soft, resilient body of the protection devices rather than exert forces against the swimming pool wall construction. By positioning a sufficient number of the protection devices within a swimming pool, all of the expansion forces of the freezing ice can be absorbed by inward flexing of the container bodies at the area of ice contact. Upon melting the ice the natural resilience of the protection devices flexes the container sidewalls outwardly to thus return the devices to the initial position to receive the expansion forces accompanying the next formation of ice.

It is therefore an object of the present invention to provide an improved swimming pool protection device of the type set forth.

It is another object of the present invention to provide a novel swimming pool protection device incorporating both buoyant and ballast means.

It is another object of the present invention to provide a swimming pool protection device including a resilient body responsive to the imposition of compression forces generated by the formation of ice.

It is another object of the present invention to provide a novel swimming pool protection device incorporating ballast means to position the device partially submerged and partially exposed at the surface of the swimming pool water.

It is another object of the present invention to provide a swimming pool protection device that is inexpensive in manufacture, rugged in construction and trouble free when in use.

Other objects and a fuller understanding of the invention will be had by referring to the following description and claims of a preferred embodiment thereof, taken in conjunction with the accompanying drawings wherein like reference characters refer to similar parts throughout the several views and in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of the invention.

FIG. 2 is a top plan view showing a number of swimming pool protection devices positioned within a swimming pool.

FIG. 3 is a side elevational view of the invention floating in a swimming pool and partially broken away to expose the internal construction.

FIG. 4 is a side elevational view similar to FIG. 3 showing the invention floating within a swimming pool wherein a layer of ice has formed.

FIG. 5 is a perspective view of a modified device showing a modified configuration.

DESCRIPTION OF THE PREFERRED EMBODIMENT OF THE INVENTION

Although specific terms are used in the following description for the sake of clarity, these terms are intended to refer only to the particular structure of my invention selected for illustration in the drawings and are not intended to define or limit the scope of the invention.

Referring now to the drawings I show in FIG. 1 a swimming pool protection device **10** formed to a generally hollow, cylindrical configuration from resilient sheet material that is impervious to water such as polyethylene plastic. The sidewalls **12** are preferably fabricated of polyethylene plastic sheet having a wall thickness of approximately one-eighth of an inch in average thickness to thereby offer sufficient resiliency and strength to withstand repeated compression and expansion cycles in response to numerous formations and thaws of a thickness of ice **14** upon the surface of swimming pool water **16**. The upper and lower ends **18, 20** of the protection device **10** are heat sealed or otherwise treated to form a completely closed and sealed container. As illustrated, the upper and lower ends **18, 20** preferably seal in a straight line configuration and form at right angles to each other to increase the utility and strength of the container construction.

As best seen in FIG. 3, a quantity of sand **22** or other flexible ballast material positions interiorly of the container sidewalls **12** to urge one end of the container downwardly when the device **10** is placed in the swimming pool water **16**. Sufficient sand or other ballast **22** should be employed to float the device **10** vertically upon the water with the exposed end **26** maintained above the surface **28** of the water. The device is rendered buoyant by entrapping a quantity of air within the container sidewalls **12** when sealing the upper and lower ends **18, 20**. A quantity of sand equal to approximately one-third of the interior volumetric contents of the container has proved generally satisfactory for the use. However, this quantity is not

critical and more or less sand may be employed as necessary to achieve the vertical positioning of the device when floating in the water having one end **26** extending above the surface **28** of the water **16**.

Referring now to FIG. **4**, a swimming pool protection device **10** is illustrated in use vertically floating in the water **16** contained within the enclosing walls **30** of a swimming pool **32**. In times of extended periods of freezing temperatures, a layer of ice forms at the top water surface **28** in well-known manner. The thickness of ice buildup is a direct function of the weather conditions and generally, the longer freezing temperatures are imposed, the thicker will be the ice buildup at the surface of the pool. In accordance with well-known physical properties of water and ice, a quantity of water freezes first at the surface and expands as it freezes to ice. Under such circumstances, without the addition of any protection devices, the forces generated by the expanding of water into ice will normally exert against the sidewalls **30** of a swimming pool **32** to thereby impose stresses at the wall construction. As illustrated in FIG. **4**, the present invention serves to compensate for the expansion forces caused by the ice by presenting a yieldable sidewall construction **12** which is considerably softer than the pool sidewalls **30**. In this manner, the expansion forces created by the ice **14** can be absorbed by constriction of the swimming pool protection devices **10** at the area of ice contact.

By providing a sufficient number of devices **10**, most of the forces generated by the formation of ice can be absorbed by constriction of the individual devices to compensate for the expansion and relieve the pool sidewalls **30** of undue stress. As illustrated, each device **10** constricts at the medial area **34** which contacts the ice buildup **14**. The sidewall material **12** is fabricated strong enough to withstand repeated contractions and expansions without permanent damage or deformation so that the devices may be employed for this use over many seasons. As illustrated in FIG. **2**, numerous devices **10** may be floated upon the water **16** of the swimming pool **32** to thereby accommodate substantially all of the expansion forces generated by the freezing ice **14**.

Referring now to FIG. **5**, I show a modified protection device **36** of generally hollow, cylindrical sidewall configuration **46** and fabricated of tough, water-resistant, resilient polyethylene plastic sheet material. A top **38** and a bottom **40** complete the enclosure of the device and are peripherally heat sealed at the top and bottom junctions **42**, **44** in well-known manner to produce a completely sealed and structurally strong container. A quantity of sand or other ballast material positions interiorly of the device **36** and is sealed therein together with a quantity of air as hereinbefore described. Accordingly then, the sand or other ballast material serves to generally position the device **36** in an upright position when floating in the swimming pool water **16**. The entrapped air provides sufficient buoyance to the construction to float the device with the upper portion exposed above the water surface. As hereinbefore stated, the quantities of sand and air entrapped within the interior of the container should be balanced as necessary to float the device in water with the upper portion exposed above the water surface **28** to thus allow the expansion forces generated by the freezing of ice to be applied directly against the device sidewall **46**.

I claim:

1. In a swimming pool protection device designed to absorb stresses generated by freezing water to ice at the water surface thereof, the combination of

A. a hollow body having a top and a bottom and at least a pair of continuous sidewalls disposed therebetween,
  1. said sidewalls being fabricated of resilient, waterproof, sheet material,
  2. said sidewalls being sealed at the said top and bottom to define a waterproof, hollow, interior space,
    a. said sidewalls being capable of flexing inwardly upon the imposition of compressive forces,
    b. the sidewalls being pressed together at the top thereof to form a linear top seal,
    c. the sidewalls being pressed together at the bottom thereof to form a linear bottom seal;

B. a quantity of flexible ballast material contained within the said interior space,
  1. said ballast material being capable of flexing upon the imposition of compressive forces upon the continuous sidewalls; and

C. a quantity of air entrapped and sealed within the interior space,
  1. the quantities of air and ballast material being controlled so as to float the device in vertical position in the water with the top exposed above the water surface.

2. The invention of claim **1** wherein the linear top seal and linear bottom seal lie in vertical planes disposed at an angle of less than 120 apart.

3. The invention of claim **2** wherein the angular relation between vertical planes defined by the top and bottom seals is 90°.

4. The invention of claim **1** wherein a portion of the sidewalls are formed to a cylindrical configuration and wherein planes drawn through the top and bottom seals diametrically orient with respect to the said cylindrical configuration.

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