POOL STRUCTURE WITH BUILT-IN, EXTERNALLY SUPPORTED SLIDE

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ABSTRACT
A molded tub-like structure, with a peripheral flange, having an integrally molded, but externally rail supported, sliding surface projecting well above the peripheral flange thereof is disclosed herein. The tub and sliding surface are unitarily formed of comparatively light-weight thermoplastic sheet material. The slide portion is reinforced and structurally supported by a truss including a pair of tubular parallel support members or rails, upon which inverted channel-like side edges of the sliding surface rest. The rails extend from beneath the sliding surface upwardly through openings formed in elevated portions thereof, and then extend downwardly and outwardly of the structure forming hand rails for a step ladder leading up to the top of the elevated sliding surface. The truss includes a plurality of transverse cross bars, at least one of which advantageously may form a step or step support, providing additional support for the sliding surface.

12 Claims, 6 Drawing Figures
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BACKGROUND OF THE INVENTION

Tub-like, pool-like and other water-retaining structures have been long known to the art for myriad purposes, paramount among which are recreational and hygienic applications. The materials employed in the construction of tubs, baths, pools and the like have varied from culture to culture and from civilization to civilization, ranging from stones and mortar to the most modern and recently developed synthetic materials such as polyethylene.

Vacuum molded or otherwise thermoformed plastic bathing tubs, wading pools, sand boxes and the like have been known and used by the art for many years. Moreover, various integral structural modifications of these tubs, pools, sand-boxes and the like have long been available. For example, auxiliary functional surfaces have been integrally molded into water-retaining structures below the peripheral edges thereof for a variety of purposes, such as for forming anatomical supporting surfaces in the nature of seats, sliding surfaces and the like. That is to say, all of the adjacent structure employed heretofore in water-retaining structures has been disposed beneath the upper peripheral edges of the structure. While these structures have generally proved to be satisfactory for the formation of seats and the like and low ramps, unlevaleted slids and the like in tubs, pools, sandboxes, etc., the art heretofore has been unable to develop a bath, pool or sandbox structure having an elevated recreational slide integrally formed therewith, i.e., a slide projecting well above the peripheral flanges.

SUMMARY OF THE PRESENT INVENTION

The present invention provides for the first time, a children’s tub, pool, or sandbox structure, having an integrally formed slide which projects well above the major peripheral edges of the tub-like structure. The new tub structure is vacuum molded or otherwise thermoformed from a single sheet of heavy gauge plastic material, such as polyethylene or a like polymeric plastic material.

The slide portion of the new structure is hollow and is uniquely reinforced to withstand those crushing forces, which may be presented by the pressure of retained water or sand when the tub or pool portion is filled, and to withstand and to support safely the weight of a sliding child or sliding children. The reinforcing support structure is in the nature of a truss formed by parallel tubular elements rigidified and strengthened by a plurality of cross bars. Advantageously, a portion of the truss structure is employed in conjunction with an integrally molded step adjacent the elevated slide to provide a stepladder leading up to the most elevated slide portion.

DESCRIPTION OF THE DRAWINGS

For a more complete understanding of the present invention and for a better appreciation of its attendant advantages, reference should be made to the following detailed description taken in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of a circular tub-like structure swimming pool having an integrally molded hollow elevated slide reinforced by a truss structure in accordance with the principles of the present invention;

FIG. 2 is a cross-sectional view of the new hollow slide structure, taken along line 2—2 of FIG. 1;

FIG. 3 is a fragmentary, cross-sectional view taken along line 3—3 of FIG. 2 and showing the nesting of the sliding surface of the new pool on the truss in accordance with the principles of the present invention;

FIG. 4 is a fragmentary cross-sectional view taken along line 4—4 of FIG. 2 showing additional detailed of construction of the truss-supported slide construction of the invention;

FIG. 5 is a cross-sectional view taken along line 5—5 of FIG. 2 showing details of construction of the truss structure; and

FIG. 6 is a fragmentary plan view of the new invention showing the arrangement of reinforcing supporting webs between the sliding surface and the pool sides.

DETAILED DESCRIPTION OF THE PRESENT INVENTION

Referring now to FIG. 1, the new structure of the present invention comprises a generally conventional tub-like structure 11, having an upper peripheral circumscribing flange 12; a slide structure 10 integrally formed with the tub-like structure 11; and a truss structure 9. The tub-like structure 11 is essentially conventional in all respects and includes substantially vertical slide walls 13 and a horizontal bottom wall 14 formed by vacuum molding sheet polyethylene.

In accordance with the principles of the invention, a hollow, elevated slide 10 is formed integrally in the tub-like structure 11 as follows. Material from central portions of the tub-like structure 11, which, absent a slide, would otherwise be used to form side walls and bottom wall portions is “borrowed” and “inverted” to define the slide structure 10. The slide structure includes an elevated, horizontal platform 16, supported well above the flange 12 by substantially vertical, aft slide side wall portions 17b, and an inclined ramp or sliding surface 15 extending between the platform 16 and the bottom wall 14, and supported by forward slide side walls 17a. The side edges of the sliding surface 15 are defined by elongated, inverted, arcuate channels 20, as shown best in FIG. 3.

In accordance with the invention, horizontal reinforcing webs 25, advantageously of sufficient surface area to form seats for the users of the pool, are suspended between the lower edges of the aft wall portions 17b and the upper edges of inwardly extending seat walls 21. The webs 25 are of sufficient size to adequately reinforce and strengthen the vertical side walls 17 against the crushing forces of water in a filled pool as well as the collapsing forces present when a child mounts the platform 16 or sliding surfaces 19. The provision of the seat walls 21 provides the pool with an open-mouth appearance and an access to a safe crawl space beneath the platform 16.

Advantageously, the elevated platform 16 is spaced inwardly from, as well as high above, the peripheral flange 12. The rear edge and side edges of the platform 16 are supported by a sloped vertical wall 26 and the uppermost portions of the slide side walls portions 17b, respectively. The lower edge of the wall 26 is supported by a horizontal step 27, which extends between the lower edge of the wall 26, and the flange 12, as shown best in FIG. 2.

Thus the integral slide 10 of the present invention includes a sliding surface 15, which slopes from the tub bottom 14 upwardly to the elevated horizontal platform 16, which is disposed well above the circumscribing peripheral flange 12. The forward or lower portions of the slide 10 are supported by the forward portions of the slide walls 17a, which extend from the bottom 14 of the pool vertically upwardly to the lower slide portions. The uppermost portions of this slide surface 15 are supported by vertical, aft slide wall portions 17b which extend upwardly from the edge portions of the horizontal reinforcing webs 25. The webs 25 define triangular seats which are disposed between seat walls 21, and the lower edges of the aft side wall portions 17b. The upper portions of the wall 17b support the platform 16 and the step 27, as shown best in FIG. 2.

In accordance with the principles of the present invention, the elevated slide structure 10 is rigidly and safely supported and reinforced by a truss structure 9 including a pair of tubular rails 30, which are sloped at the same angle as the sliding surface 15. The slide support rails 30 are elongated aluminum tubes, the ends of which are downwardly bent to form front and rear supporting legs 31, 32, respectively, which rest on the ground. More specifically, and as shown best in FIG. 3, the rails 30 have a circular cross section of a diameter, which is substantially equal to the inner diameter of the channel 20, such that the channels 20a each rest firmly on the rails 30 to support the slide with maximum stability. At an important
aspect of the present invention, the rails 30 of the truss 9 extend through the sliding surface 15 at openings 35 in the channels 20 at the points at which the channels 20 intersect with the platform 16, as shown in FIG. 2. Of equal importance, a cross bar 40 is disposed beneath the upper edge of the sliding surface 15 and the forward edge of the platform 16 at the line of their intersection.

The reinforcing cross bar 30 of the truss 9 advantageously is a solid rod, having threads 41 formed at outer reduced diameter portions 42, which form shoulders 43 with the central portions of the cross bar 40. Cross bar 40 extends completely across and beneath the sliding surface 15 and between the two rails 30, firmly spacing and rigidifying the truss 9, as will be understood. Specifically, the cross bar 40 is placed between the rails 30 and through the walls 17b by inserting the end portions 42 of the cross bars through holes 36, 37 formed in the rails 30 and walls 17b, respectively, to butt the shoulders 43 against the rail walls and to project the threads 41 beyond the walls 17b. Thereafter the cross bar 40 is secured by lock nuts 45, as shown best in FIG. 3. Of course, for a simpler construction, the bar 40 may be integral (i.e., the shoulder 43 may be omitted). The legs 32 of the truss are themselves rigidified by another cross bar 50, similar in construction to the cross bar 40, which cross bar spaces and rigidifies the legs 32 at a point between the ground and the step 27. The cross bar 50 advantageously passes through vertical wall portions 53 of a blow molded or otherwise formed plastic step 51, having U-shaped slots 52 to accommodate the legs 32, as shown in FIG. 5. The parallel legs 32 of the truss are further rigidified and reinforced by bolts 60 (FIG. 4) which fasten the hollow leg portions 32 directly to the flange 12. While two separate bolts 60 may be employed, advantageously a single elongated U-shaped or double ended bolt 60, the ends of which are threaded at 61, is employed for faster assembly and to provide an additional reinforcing cross bar adjacent the plastic flange 12 in the area at which the rails 32 are attached.

The walls 13 of the tub or pool structure, may themselves be strengthened or stiffened in known fashion by the incorporation therein of integral horizontal and vertical reinforcing ribs 80, 81, respectively. Advantageously, and as shown in FIG. 1, superior reinforcement may be obtained by employing the illustrated waffle-like or square wave pattern of reinforcing ribs 80, 81, in which arrangement the ribs are employed in two tiers with the vertical ribs 81 alternating, as shown. In addition, the step surfaces as well as the exposed surfaces of the bottom wall may be provided with suitable treads 70 or the like to improve traction.

It will be appreciated that the foregoing slide and truss construction of the invention may be incorporated into a tub, or pool of any geometric configuration. Moreover, it will be appreciated that the specific reinforcing truss arrangements may be used to make safe, to upgrade, or to otherwise modify previously known pools whose strength has proved inadequate to resist crushing hydrostatic forces present with deep filling of the structure and whose strength has been inadequate to resist the collapsing forces present when the slide is loaded by a child's weight.

It will be appreciated that the pool structures of the invention may be economically produced by using a unique "compound construction" (polyethylene sliding surfaces supported by a tubular aluminum truss) to provide non-collapsible, safe slides having highly elevated sliding surfaces. As used herein, "elevated" is intended to mean projecting well above the peripheral flange of the tub or pool structure. By way of illustrative example, the elevated platform 16 is approximately 0.5 feet above the flange 12 in a pool having a diameter of approximately 5.5 feet and side walls 13 having a height of 1.25 feet. In other words, the integral slides of the present invention have "elevation ratios," i.e., slide height to tub side wall height, of greater than 1.0, e.g., approximately 1.25 to 1.40. Compared to "elevation ratios" of 1.0 less for previous tubs or pools with integral slides. Typical thickness of the plastic sheet material of the structure is approximately 0.375 to 0.5 inches before molding; the final product may be as thin as approximately 0.04 inches in certain areas.

The present invention has been described, only by way of example and not limitation, with reference to a tub or pool structure. It will be appreciated that a safe, inexpensive, non-collapsible children's slide may be made by omitting the tub-forming portions 11 of the structure of FIG. 1. Such a slide would, of course be comprised of hollow plastic slide structure 10 and the truss structure 9. The plastic shell is, of course, seamless and would not present sharp joints or corners to abrade, pinch or otherwise harm a sliding child while at the same time the hollow shell would be stabilized, rigidified, and reinforced by the truss structure 9, which engagingly supports both internal and external surfaces of the hollow slide 10.

I claim:

1. A non-collapsible, elevated, compound slide structure for a plastic water retaining pool having side walls of predetermined height and a bottom wall, said slide structure including:
   a. sliding surface formed integrally with said tub and sloping upwardly from said bottom wall to a height well above the upper edges of said side walls;
   b. inverted channel means defining side edges of said sliding surface and having openings at the top of said sliding surface;
   c. generally vertical slide wall means spacing said sliding surfaces from the plane of said bottom wall;
   d. a truss structure including spaced, sloped, longitudinal rails nested in said channel means;
   e. upper portions of said rails projecting through said openings and above said sliding surface;
   f. support leg means extending from the plane of said bottom wall to said upper portions of said rails and being joined therewith;
   g. first cross bar means extending transversely between and through said rails and through said slide wall means beneath and adjacent said sliding surface;
   h. means securing said first cross bar in place between said rails to rigidify said truss and reinforce said sliding surface;
   i. second cross bar means extending between and through said leg means; and
   j. means securing said second cross bar means in place between said leg means to rigidify said truss structure.

2. The non-collapsible slide structure of claim 1, further characterized, in that
   a. said side walls terminate in a peripheral flange;
   b. fastening means secure said leg means to said flange.

3. The non-collapsible slide structure of claim 2, in which
   a. said fastening means comprises a shallow, elongated U-shaped third cross bar means, said third cross bar means extending between said leg means and through said flange.

4. The non-collapsible slide structure of claim 1, in which
   a. a horizontal platform is connected to the top edge of said sliding surface;
   b. a platform wall spaces the platform from the pool side walls.

5. The non-collapsible slide structure of claim 4, in which
   a. integral step means are included at said flange adjacent and between said leg means;
   b. said platform wall extends between the rear edge of said platform and the forward edge of said step means.

6. The non-collapsible slide structure of claim 1, in which
   a. said rails and leg means are of integral tubular construction.

7. The non-collapsible slide structure of claim 1, in which
   a. forward leg means substantially shorter than said first-mentioned leg means extend from the plane of said bottom wall to lower portions of said rails.

8. The non-collapsible slide structure of claim 7, in which
   a. said leg means and rails are elongated, integral aluminum tubes, both ends of which have been bent in a common plane.

9. The slide structure of claim 1, in which
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a. integral reinforcing webs are disposed in a horizontal plane intermediate of the plane of said bottom wall and the plane of the peripheral edge of said pool;
b. said webs are generally triangular in configuration, two of the edges of each web connecting said slide wall means and said pool side walls;
c. the third edge of each web defining the front edge of a seat;
d. generally vertical seat wall means extending between said slide wall means and said pool side walls and extending between said third web edges and said bottom wall;
e. whereby said slide wall means supporting said sliding surface are further reinforced against collapsing forces and are further rigidified by said webs and seat wall means.
10. The non-collapsible slide structure of claim 1 in which
a. said channel means are parallel.
11. A children's pool and slide structure, comprising
a. a seamless water retaining tub structure having a bottom wall and upstanding side walls;
b. a hollow slide structure formed integrally with said tub structure and having uppermost portions projecting above the upper edges of said side walls, said projecting portion thereby being elevated with respect to said side walls; and
c. independent support means engaging and supporting said slide structure at least at said elevated portions thereof.
12. A non-collapsible children’s safety slide comprising
a. a seamless, hollow plastic shell member;
b. a truss structure reinforcing said hollow shell and supportingly engaging inner and outer surfaces thereof;
c. said shell member including a sloping sliding surface; the side edges of which are defined by inverted channels of arcuate cross section, a horizontal platform joining the upper edge of said sliding surface, and generally vertical slide wall means connected to said sliding surface and platform side edges;
d. said shell defining two openings at the upper ends of said channel means;
e. shell wall means connected to the rear edge portions of said platform and extending between said vertical slide wall means;
f. a pair of elongated tubular first rails which nest in said channels and thereby engagingly support the internal surfaces of said shell, said rails extending through said openings and above and beyond said sliding surface;
g. leg rails extending from the plane of the bottom of said sliding surface to and joining with said first rails at points above said sliding surface;
h. said leg rails engaging said shell wall means;
i. means fastening said leg rails to said shell wall means, said leg rails thereby supportingly engaging external surfaces of said shell member;
j. at least one crossbar means extending between said first rails and through said shell member and adapted to provide internal support for said shell member;
k. pool forming means including a bottom wall and side wall means are formed integrally with said sliding surface and said shell member with the water retaining surfaces of said pool forming means being contiguous with outer surfaces of said shell and the outer surfaces of said pool being contiguous with the inner surfaces of said shell.

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