United States Patent [19]

West

[11] **3,755,981**

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[54] **SWIMMING POOL STAIRS**

[75] Inventor: **Robert E. West,** Yardley, Pa.

[73] Assignee: **Cascade Industries, Incorporated,** Edison, N.J.

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[52] **U.S. Cl.** **52/184,** 4/172, 52/169

[51] **Int. Cl.** **E04f 11/00,** E04h 3/16

[58] **Field of Search** 52/182, 393, 169, 52/184; 4/172.19, 172

[56] **References Cited**

UNITED STATES PATENTS

3,236,012	2/1966	Laven	4/172 X
3,478,370	11/1969	Stern et al.	4/172
3,429,085	2/1969	Stillman	52/169
3,374,491	3/1968	Patin et al.	52/169 X

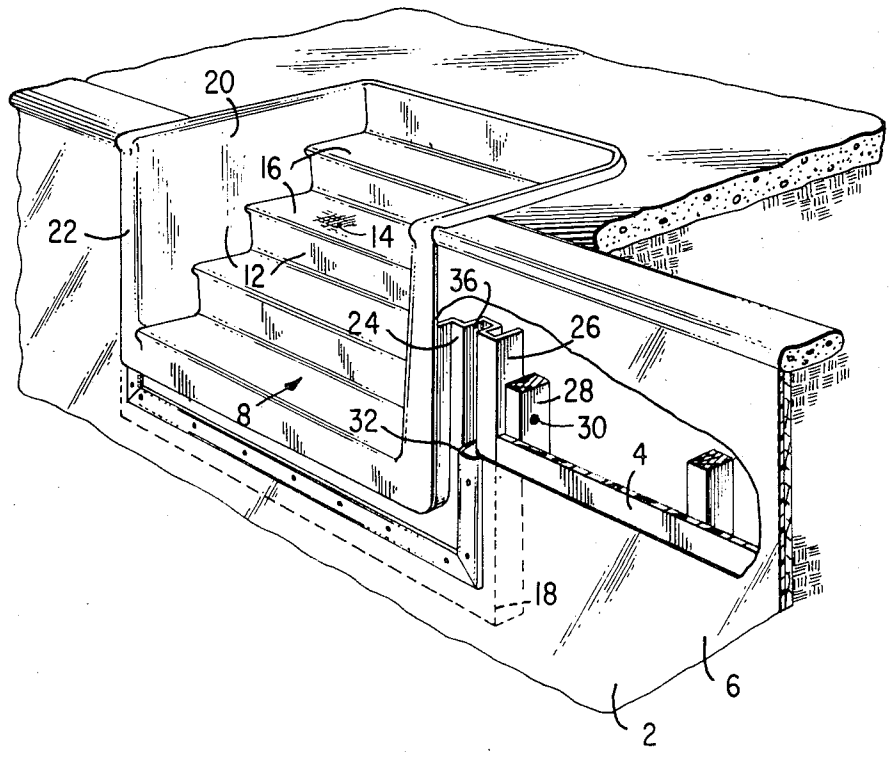
Primary Examiner—Price C. Faw, Jr.

Attorney—Albert Sperry et al.

[57] **ABSTRACT**

A swimming pool having side walls is provided with a liner formed of sheet material extending over the inner surface of the side walls. The pool has a step structure set into an opening in the side wall of the pool and has marginal portions thereof secured to the side wall of the pool. The liner of the pool has edge portions overlapping the marginal portions of the step structure and means are provided for establishing a water-tight seal between the liner and step structure.

7 Claims, 4 Drawing Figures



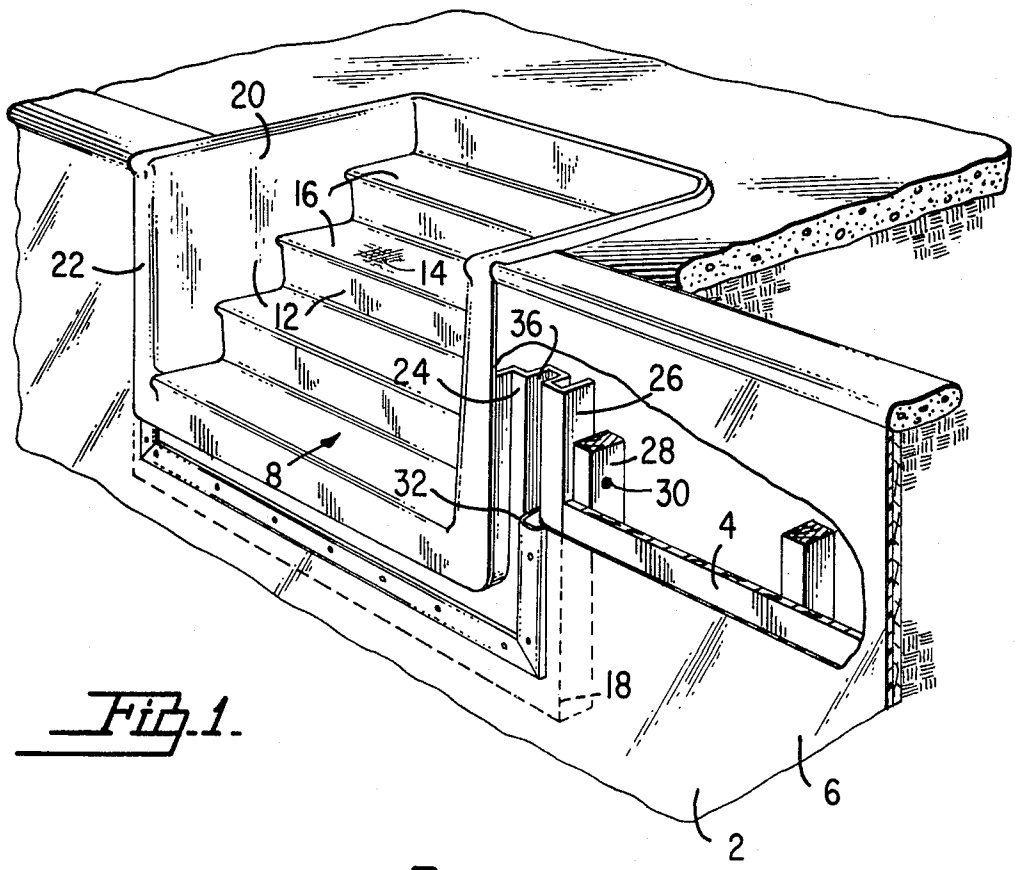

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Fig. 1.

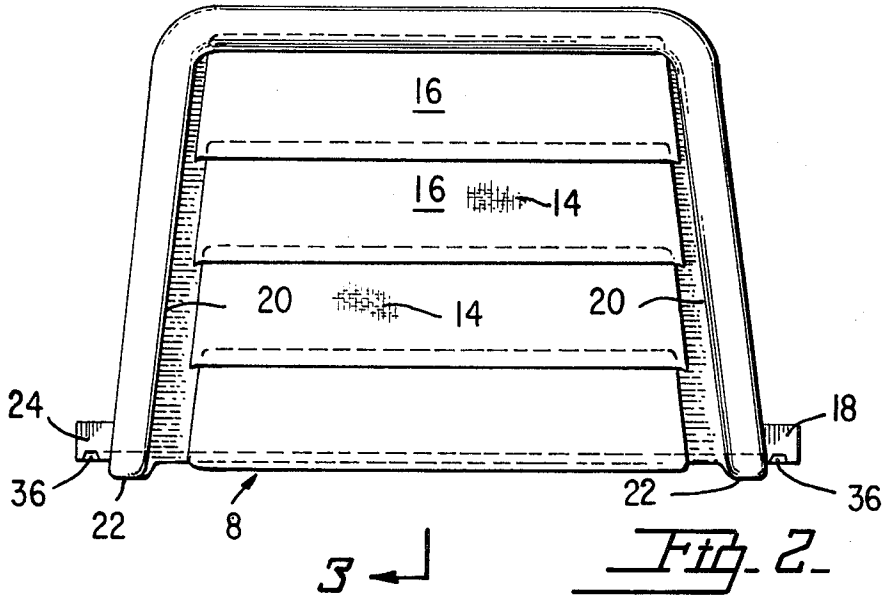

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Fig. 2.

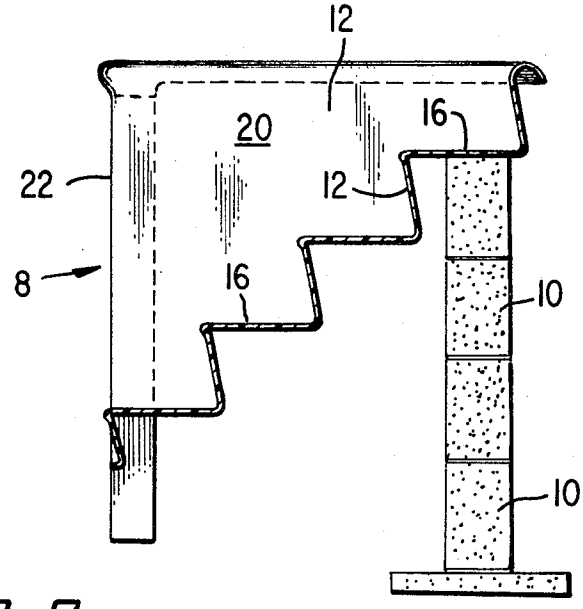


Fig. 3

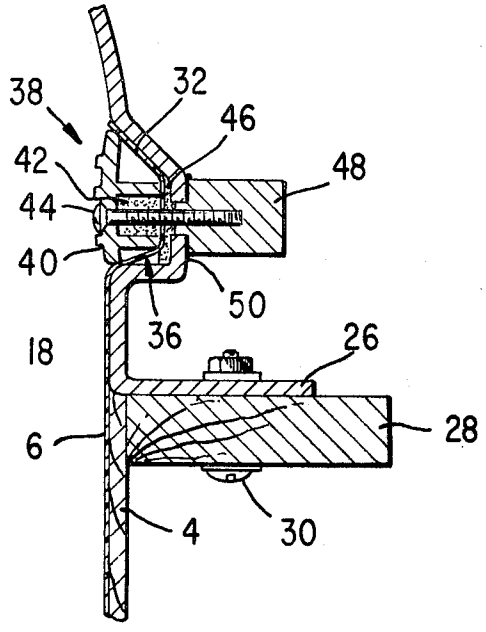


Fig. 4

SWIMMING POOL STAIRS

FIELD OF INVENTION

It is common practice to provide a swimming pool with side walls having a liner formed of sheet material extending across the bottom and about the side walls of the pool. Typical swimming pools of this type are disclosed in U.S. Pat. Nos. 3,094,709 and 3,440,780. In many instances such pools are provided with ladders which are mounted on the deck extending about the pool to permit persons using the pool to enter and leave the pool more readily. However, it is not always safe for children and other to use a ladder for this purpose and many people enjoy sitting on the steps of a pool with their feet in the water or to use steps so that they may enter the pool gradually and easily.

It is further been suggested that a step structure be located in the side wall of a pool as exemplified by U.S. Pat. No. 3,236,012 but the construction thus provided does not establish an adequate water-tight seal between the step structure and pool liner. In other constructions the pool liner is formed to extend into the step structure and over the steps thereof to prevent leakage therethrough but since the liner is smooth and slippery the steps then become hazardous.

In accordance with the present invention a step structure is provided with non-slip treads and is constructed so as to set into an opening in the side wall of a pool. The structure is formed with marginal portions which are secured to the side wall of the pool while the edges of the pool liner adjacent the opening overlap the marginal portions of the step structure and means are provided for establishing a water-tight seal between the edges of the liner and the marginal portions of the step structure.

THE DRAWINGS

FIG. 1 is a perspective illustrating a portion of a swimming pool embodying the present invention, with parts thereof broken away;

FIG. 2 is a top plan view of the portion of the swimming pool illustrated in FIG. 1;

FIG. 3 is a sectional view of the step structure illustrating FIGS. 1 and 2 taken on the line 3—3 of FIG. 2;

FIG. 4 is an enlarged sectional view of a portion of the step structure of FIG. 3 illustrating the manner in which the pool liner and retaining means therefore may be assembled.

PREFERRED EMBODIMENT

In that form of the invention chosen for purposes of illustration in the drawings, the pool is provided with side walls 2 embodying panels 4 which may be formed of wood, metal or the like and extend vertically upward about the sides of the pool. A liner 6 formed of sheet material, such as polyvinyl sheeting or the like, extends across the bottom of the pool where it rests upon earth or other supporting material and extends upward over the inner surface of the wall panels 4 about the sides of the pool.

A step structure 8 is positioned within an opening or cut out portion of the wall panels 4 and extends outward from the side wall 2 into position to be backed up and at least partially supported by piers 10, fill dirt, or the like on the outer sides of the pool. The step structure 8 may be formed as a unitary molded, cast or formed member presenting an inwardly facing surface

12 through which water cannot pass. Such a structure may conveniently be produced of molded plastic material reinforced with fiber glass or the like and the treads 14 of the steps 16, thereof may have triangular or other irregularities molded into the upper face thereof to present a non-slip surface if desired. However, the step structure may, if desired, be formed as a precast cement, metal or other pre-formed material. The unit thus produced is strong, relatively light in weight and may be easily and economically produced and installed in the pool assembly.

In the preferred construction shown, the step structure 8 is provided with a lower marginal portion 18 extending downwardly along the horizontal front edge of the structure and is formed with opposite side walls 20 between which the steps 16 extend. The front edges 22 of the side walls 20 are formed with similar outwardly projecting marginal portions 24. Each of the marginal portions 18 and 24 has rearwardly turned flanges 26 adapted to be bolted or otherwise secured to complementary flanges, studs, or framing members 28 about the opening in the side wall 2 of the pool in which the step structure is located. Bolts 30 may be employed for this purpose.

The vertically extending portion of the liner 6 of the pool is cut out in the area of the opening in which the step structure 8 is located and presents portions 32 adjacent the opening which are secured to the marginal portions 18 and 24 of the step structure in a manner to establish a water-tight seal between the liner and step structure. This is preferably accomplished by forming the marginal portions 18 and 24 with channels 36 in the exposed forwardly and inwardly facing surfaces of the marginal portions. The edges 32 of the liner 6 are extended into overlapping relation with the outer edges of the marginal portions 18 and 24 and into the channels 36 as shown most clearly in FIG. 4. Retaining means 38, in the form of elongated strips of material 40 are forced into the channels 36 over the edge portions 32 of the liner so as to firmly grip the liner and hold it in sealing contact with the step structure.

The strips of retaining means 38 may be formed of extruded and hardened polyvinyl chloride, aluminum, or other material. If a plastic material is used in forming the retaining means 38 a reinforcing or backing member 42 may extend longitudinally of the strip to strengthen the strip and prevent it from bending when it is forced into the channel 36. It is then possible to urge the edges of the liner forceably into sealing and retaining engagement with the adjacent surfaces of the marginal portions 26 and 32 of the step structure by means of bolts 44 or other fastening means. A layer of cushioning material 46 is preferably located in the channel 36 so that when the retaining strip 40 is forced into place over the edges 32 of the liner, the cushioning material will be compressed and the liner 6 will be effectively sealed to the step structure without danger of tearing or cutting the liner material. The edges 32 of the liner 6 which projects inward over the flanges 26 and 32 beyond the retaining means 38 may then be trimmed off to provide a neat attractive appearance.

The strips 40 are preferably formed to receive the bolts 44 passed through the strips and liner and through the base of the channel 36 and receive a blind nut 48 so as to preclude leakage of water past the bolt. A sealing compound 50 may be applied in the base of channel 36 and about the opening through which the bolt passes

to further prevent possible leakage past the retaining means and through the bolt holes.

After the step structure **8** has been placed in position in the opening in the wall of the pool, it is secured to the framing members **28** located about the opposite sides and along the lower edge of the opening in which the step structure is placed. If desired the step structure further may be supported and held in place by inserting a pier **10** or the like beneath the structure on the outer side of the wall assembly before back filling with dirt or installing the deck of the pool whereby the weight of persons using the steps will not be applied directly to the portion of the wall panels adjacent the opening therein where the steps are located. Cushioning material **46** is then placed in channels **36** and the edge portions **32** of the liner are drawn inward over the marginal portions **18** and **24** of the step structure and across the channels **36** therein. The retaining means **38,** including strips **40** are pressed into the channels over the edge portion **32** of the liner and forced into sealing engagement therewith by the bolts **44** and blind nuts **48.** In this way an effective water-tight sealing connection is established which precludes leakage of water between the pool liner and step structure.

The upper horizontal edges of the step structure about the sides and rear thereof preferably are provided with outwardly and downwardly turned flanges **54** which are positioned to engage the upper surface of the deck **56** or or fill about the outer sides of the side walls **2** of the pool.

While a particular design and type of step structure has been shown in the drawings and described above, it will be apparent that the form, construction and arrangement of the various elements thereof and the manner in which the parts are assembled and installed are capable of many modifications and changes. In view thereof, it should be understood that the particular embodiment of the invention shown is intended to be illustrative only and is not intended to limit the scope of the following claims.

I claim:

1. A swimming pool having a side wall with an opening therein for receiving a step structure, a liner formed of sheet material located on the inner surface of said side wall and having edge portions thereof located adjacent said opening in the side wall of the pool, a step structure located in said opening, said step structure having marginal portions thereof bearing against the inner surface of the side wall of the pool adjacent the opening therein, said marginal portions of the step structure being in the form of flanges overlapping and bearing against the inner surface of the side wall of the pool about the sides and lower edge of said opening, said edge portions of the liner overlapping the outer edges of said flanges and secured to said flanges by means establishing a water tight seal between the overlapping edge portions of the liner and the flanges on the marginal portions of said step structure.

2. A swimming pool as defined in claim **1** wherein said marginal portions of the step structure are formed with channels therein into which said edge portions of the liner extend, and means are located in said channel for establishing a water-tight seal between the liner and marginal portions of the step structure.

3. A swimming pool as defined in claim **1** wherein the inwardly facing surfaces of said flanges have channels therein into which the overlapping edges of the liner extend and retaining means are located in said channel over the overlapping edges of the liner to secure the liner to the step structure and establish a water-tight seal therewith.

4. A swimming pool as defined in claim **3** wherein cushioning means are located in said channels between said flanges and liner.

5. A swimming pool as defined in claim **3** wherein said retaining means is a strip of extruded material.

6. A swimming pool as defined in claim **5** wherein bolts pass through said strip, liner and flange into engagement with the side wall of the pool to secure the step structure in place.

7. A swimming pool as defined in claim **3** wherein said retaining means is a strip of extruded plastic material and has a metal reinforcing member extending longitudinally thereof.

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