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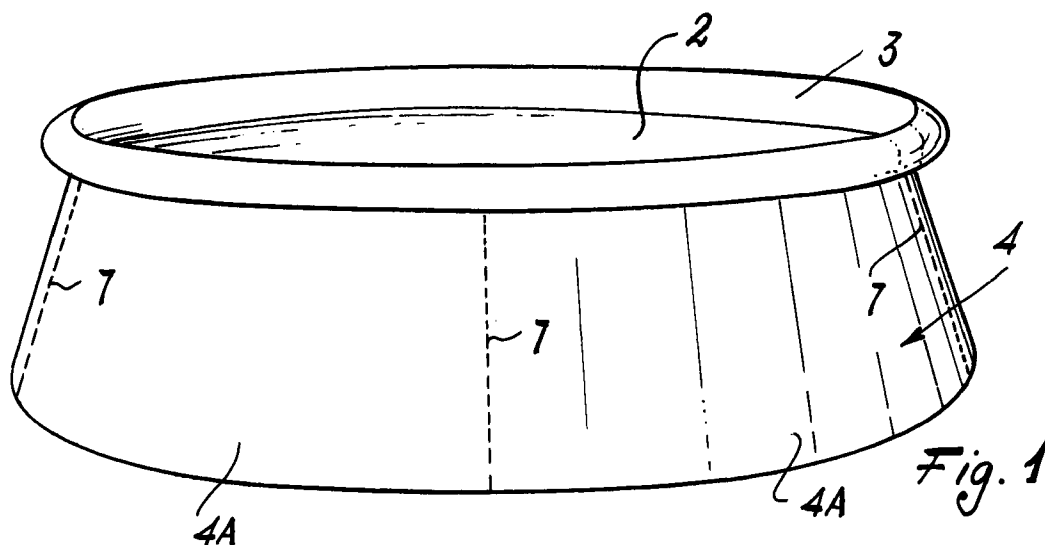
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(54) Variable-height swimming pool

(57) A swimming pool of the type comprising a base wall (1), and a side wall (2) connected to said base wall and comprising at least one inflatable upper rim (3). The side wall (2) is a smooth wall and is constructed of a

flexible plastic material deformable under the action of the hydrostatic pressure.



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Description

This invention relates to a swimming pool in accordance with the pre-characterising part of the main claim.

Swimming pools are known constructed of a flexible plastic material which deforms under the action of the hydrostatic pressure, typically polyvinyl chloride (hereinafter known as PVC) unsupported, ie without an internal fabric reinforcement layer. They comprise a side wall formed from one or more inflatable tubular elements.

This first type of swimming pool has numerous drawbacks, first of which is the fact that the operations involved in its inflation are relatively lengthy and tiring. In addition, its repair is relatively difficult if one of the side wall tubes is damaged.

Moreover the lateral surface which has to withstand the water pressure comprises numerous lengthy weld lines connecting together the various constituent tubes of the side wall of the swimming pool and its base. The swimming pool side wall consequently has a plurality of regions weakened by the welding, which have a pressure resistance less than the remaining parts of the wall and represent particularly critical regions especially in large-dimension swimming pools.

Other swimming pools constructed of flexible deformable plastic material are also known comprising a base wall and side wall, both formed of said material, which are thermowelded together normally by high-frequency welding, and a lateral rigid support structure at the upper edge, to which the edge of said side wall is connected. This second type of swimming pool also involves relatively lengthy and complicated assembly, as the different constituent parts of the lateral rigid support structure have to be connected carefully together and to members which fix them to each other. The rigid structure of such swimming pools, when disassembled, is relatively bulky and heavy, resulting in problems both for its storage and for its marketing and distribution.

Moreover the height of the rigid support structure above the ground is generally considerable and consequently represents an obstacle difficult to overcome for children, who therefore cannot use this type of swimming pool.

Finally, swimming pools are known comprising a base wall and an inflatable upper free rim, both constructed of a deformable plastic material, and a side wall thermowelded, normally by high-frequency welding, to the base and to the rim, but constructed of a flexible plastic material which is not deformed by the pressure exerted by the water, for example a supported PVC or a multi-layer structure comprising an inner layer of a fabric, for example polyester, on the two sides of which there is applied a sheet or layer of PVC, for example by calendaring, by spreading or by adhesive.

The side wall of this third type of swimming pool is not cylindrical. Being constructed of a material which is not easily deformable but is also not sufficiently rigid it has to be of frusto-conical shape, with its major base at the bottom. This wall is divided into a plurality of panels

welded transversely together, to the upper rim and to the base.

For its construction, this third type of swimming pool requires the welding together of materials which are mutually different, this being relatively lengthy and complicated because it is difficult to automate and is therefore generally done manually.

Again, if the side wall of such swimming pools is damaged and a patch cannot be applied, the swimming pool must be completely replaced.

These swimming pools can only be used by filling them up to their upper rim, making it impossible to adjust the height of the water level. As such swimming pools generally have a relatively tall side wall, they can only be used by adults and not by children.

An object of the present invention is to provide a swimming pool which obviates the drawbacks of the aforesaid swimming pools and in particular is of simple and fast construction, is of small bulk and weight when disassembled, and is of easy and rapid assembly.

A further object is to provide a swimming pool in which the water level can be adjusted and which can hence be used both by children and by adults.

A further object is to provide a swimming pool in which the side wall on which the water pressure acts has a greater resistance to this pressure.

A further object is to provide a swimming pool in which the side wall can be repaired and/or easily replaced, even if seriously damaged.

A further object is to provide a swimming pool which for equal characteristics is of lower cost and shorter construction time than similar swimming pools.

These and further objects which will be apparent to an expert of the art are attained by a swimming pool in accordance with the characterising part of claim 1.

The present invention will be more apparent from the accompanying drawings, which are provided by way of non-limiting example and in which:

Figure 1 is a perspective schematic view of a swimming pool according to the invention in a first form of utilization;

Figure 2 is a perspective schematic view thereof in a second form of utilization;

Figure 3 is a schematic cross-section through the swimming pool of Figure 1.

Figure 4 is a schematic cross-section through the swimming pool of Figure 2.

With reference to Figures 1 and 3 a swimming pool according to the invention comprises: a base wall 1, an inner side wall 2 having in correspondence with its free edge an inflatable tubular part 3, and an outer lateral support wall 4. The inner wall 2 is a smooth wall, ie formed not from an assembly of superposed tubular elements but as a single wall.

The inner side wall 2 and the base wall are welded together along the lower edge of the side wall, the weld line being indicated by 5 in the figures. The inner side

wall 2, which is advantageously formed in a single piece, has a lateral weld line 6 which joins together the minor sides of the piece of plastic material from which this wall is constructed. Advantageously, as is usual for the expert of the art, the inflatable tube 3 is formed in one piece with the wall 2 by folding a free end piece of the side wall into a tube, welding it to the wall itself and applying a conventional plug (not shown).

In the illustrated example the outer wall is of frusto-conical shape and is constructed by laterally welding together a plurality of panels 4A of substantially isosceles trapezoidal shape (the lateral weld lines are shown dashed and indicated by 7 in Figure 1).

The inner side wall and base wall are constructed of a conventional flexible plastic material deformable under the action of the hydrostatic pressure, preferably unsupported PVC. The outer side wall 4 is constructed of a conventional flexible plastic material which does not deform under the action of the hydrostatic pressure, preferably supported PVC.

To further stiffen the swimming pool it can advantageously comprise a cord 8 along the lower edge of the tube 2 (Figures 3, 4).

The swimming pool according to the invention can be used with or without the outer support wall 4. In Figures 2 and 4 the swimming pool is shown used without the support wall. In this case having inflated the tube 3 and filled the swimming pool, the side wall bulges outwards by the action of the hydrostatic pressure (as shown in the figure) more or less according to the water level in the swimming pool.

The swimming pool can therefore be used even by very small children (who can easily enter the pool) as it is not of excessive height, this height being in any event adjustable by pouring more or less water into the swimming pool.

It should also be noted that in this manner of utilization, the hydrostatic pressure is exerted laterally on a wall consisting of a single piece comprising a single transverse weld 6. Except for this weld region the wall comprises no further regions of weakness in which breakages could occur. It should also be noted that in this form of utilization the weld at the base is stressed only relatively, because part of the side wall rests on the ground (Figure 4).

Figures 1 and 3 show a different manner of using the swimming pool. In this case, after filling the swimming pool with a few centimetres of water (for example 20 cm), the outer lateral support wall 4 is drawn over the inner side wall 2, the tube 3 is inflated and the pool is further filled until the water level reaches the tube 3 (as shown in Figure 3). In this manner the swimming pool can be used by adults.

If the outer wall is damaged it can be easily replaced as it is in no way connected to the base or to the inner wall 2.

The fact that the outer indeformable wall does not have to be welded to the tube 3 or to the base 1 of the swimming pool considerably facilitates the pool construction.

In this respect it is no longer necessary to make the difficult welds between deformable and non-deformable materials.

It should be further noted that when not in use, the swimming pool can be completely folded up to present a very small bulk.

Finally, it should be noted that the aforescribed embodiment is provided by way of example only, and that numerous modifications falling within the same inventive concept are possible. For example two overlying inflatable tubes could be provided, and/or the swimming pool could be formed of a different shape than that shown. The various panels 4A which make up the outer wall could be joined together not by welding but in a different known manner, for example by cords passing through metal rings provided along the minor edges of the panels.

Claims

1. A swimming pool of the type comprising a base wall (1), and a side wall (2) connected to said base wall and comprising at least one inflatable upper rim (3), characterised in that the side wall is a smooth wall and is constructed of a flexible plastic material deformable under the action of the hydrostatic pressure.
2. A swimming pool as claimed in claim 1, characterised by comprising an outer wall (4) constructed of a flexible plastic material not deformable under the action of the hydrostatic pressure, said outer wall (4) being shaped in such a manner as to be able to be drawn over said inner wall (2) into contact therewith.
3. A swimming pool as claimed in claim 2, characterised in that the outer wall (4) is of frusto-conical or frusto-pyramidal shape
4. A swimming pool as claimed in claim 2, characterised in that the outer wall (4) comprises a plurality of parts (4A) rigidly joined together.
5. A swimming pool as claimed in claim 1, characterised by comprising at least one stiffening element (8), said element being provided along the upper edge of the inner side wall (2).
6. A swimming pool as claimed in claim 1, characterised in that the stiffening element is a cord (8).
7. A swimming pool as claimed in one of the preceding claims, characterised in that the outer wall (4) is constructed of supported PVC, whereas the inner wall (2) and the base are constructed of unsupported PVC.
8. A swimming pool as claimed in claim 1, character-

ised in that the inflatable upper rim (3) is formed integral with the inner wall (2).

9. A support element for a flexible side wall deformable under the action of the hydrostatic pressure of a swimming pool claimed in claim 1, characterised by being flexible, being shaped in such a manner as to be able to be drawn over and into contact with a side wall (2) of said swimming pool, and being constructed of a plastic material not deformable under the action of the hydrostatic pressure.
10. A support element as claimed in claim 9, characterised by being of frusto-conical or frusto-pyramidal shape.
11. A support element as claimed in claim 9, characterised by comprising a plurality of parts (4A) joined rigidly together.

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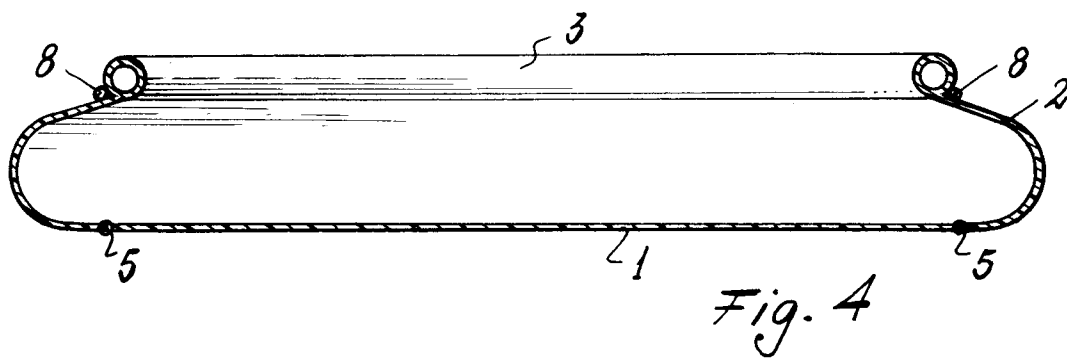
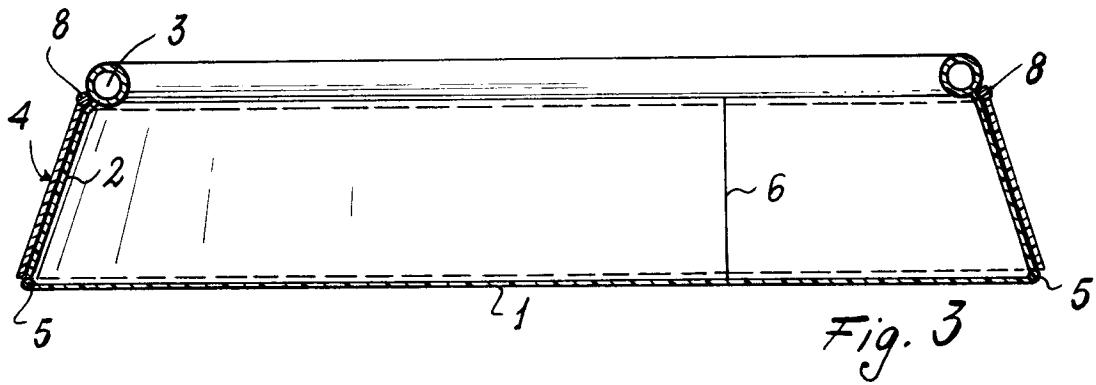
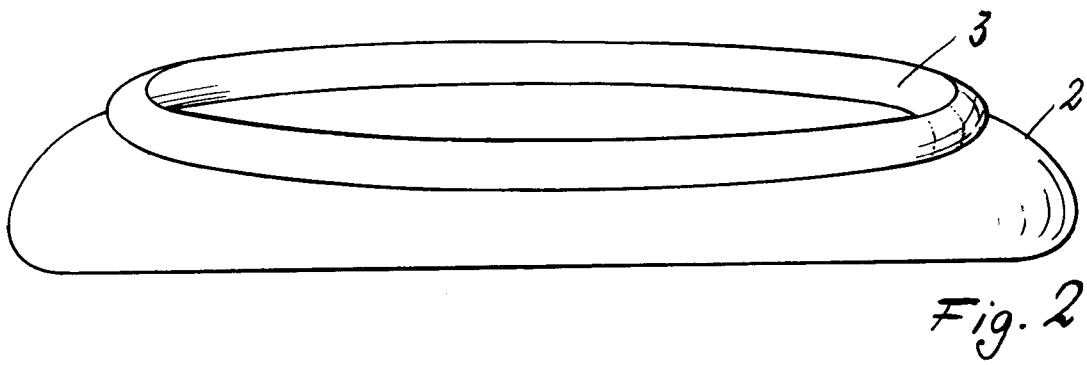
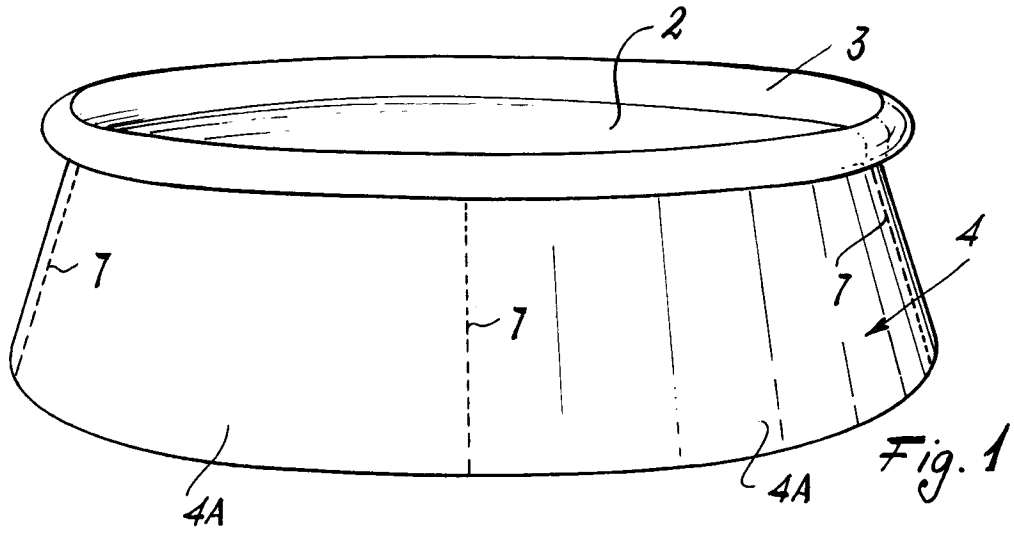
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EUROPEAN SEARCH REPORT

Application Number
EP 96 11 6419

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X A	US-A-2 842 776 (ZAKIN) * column 1, line 48 - column 2, line 11; figures 1-3 * ---	1 2,4,7,9, 11	E04H4/00
X A	FR-A-1 375 044 (ROCCHISANI) * page 1, left-hand column, line 1 - right-hand column, line 1; figures 1,4 * * page 2, left-hand column, line 20-22 * ---	1,3 2	
X A	US-A-2 529 872 (HASSELQUIST) * column 1, line 36 - column 2, line 35 * ---	1 7	
X	FR-A-2 600 988 (BUT) * page 1, line 37 - page 2, line 36; figures 1-4 * ---	1,8	
A	FR-A-2 550 572 (TRABOUILLET) * page 4, line 14-20; figure 6 * -----	5,6	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			E04H
Place of search THE HAGUE		Date of completion of the search 17 January 1997	Examiner Kergueno, J
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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