



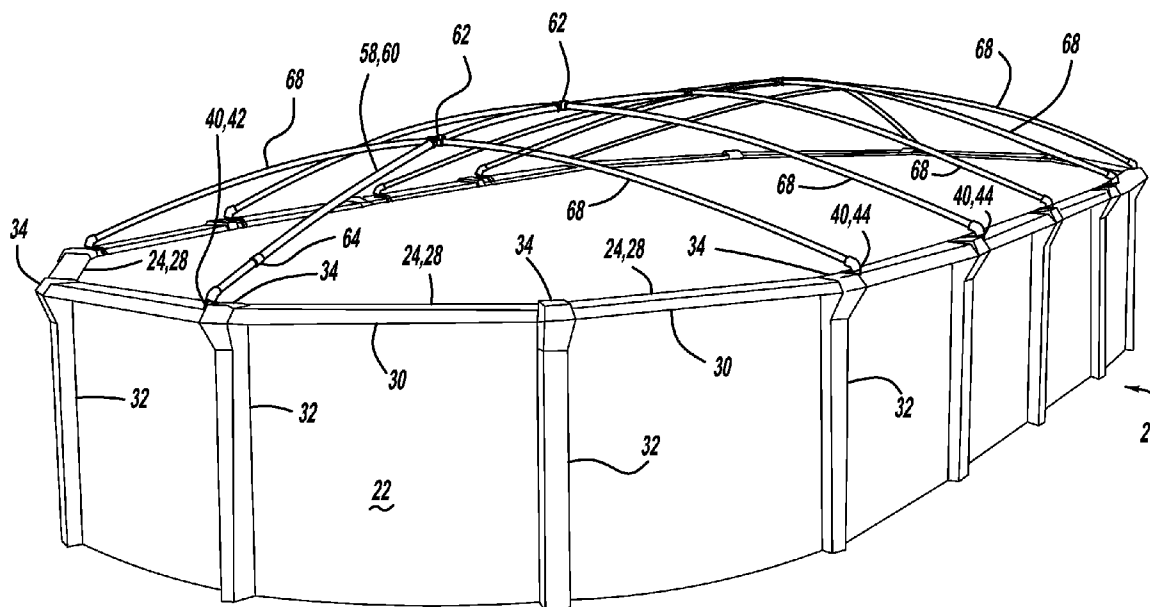
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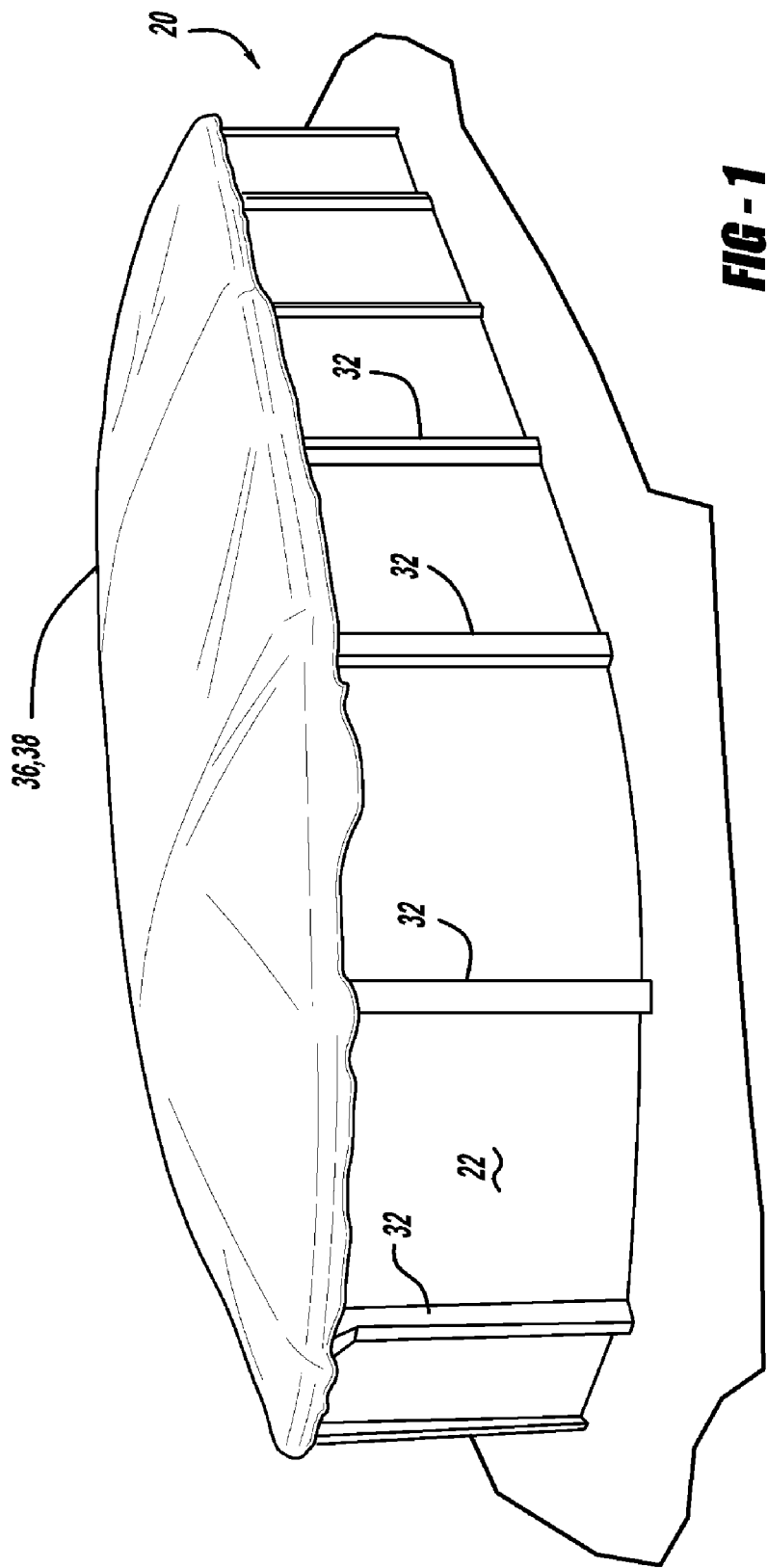
(19) **United States**(12) **Patent Application Publication**
Johnston(10) **Pub. No.: US 2007/0199141 A1**(43) **Pub. Date: Aug. 30, 2007**(54) **COVERED SWIMMING POOL AND FRAME**(52) **U.S. Cl. 4/498**(76) **Inventor: John C. Johnston**, Clinton Township,
MI (US)(57) **ABSTRACT**

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GREGORY T. ZALECKI**12900 HALL ROAD****SUITE 400****STERLING HEIGHTS, MI 48313 (US)**(21) **Appl. No.: 11/307,920**(22) **Filed: Feb. 28, 2006****Publication Classification**(51) **Int. Cl.**
E04H 4/00 (2006.01)

A covered swimming pool is comprised of an aboveground swimming pool, two spine brackets, a plurality of pairs of rib brackets, a flexible spine, a plurality of flexible rib pairs and a cover. The spine brackets are mounted to opposing ends of the rail of the pool. The rib bracket pairs are each mounted to opposing ends of the rail. The flexible spine is attached to the spine brackets such that the spine is bowed above the pool. Each flexible rib pair is transversely attached to the spine and a pair of rib brackets. The cover is draped over the spine, ribs and rail. The cover is secured to the rail with cover clips. Each cover clip is comprised of a tubular body having a lengthwise slit defining a pair of clamping surfaces. A flexible protective membrane is inserted between the clamping surfaces.





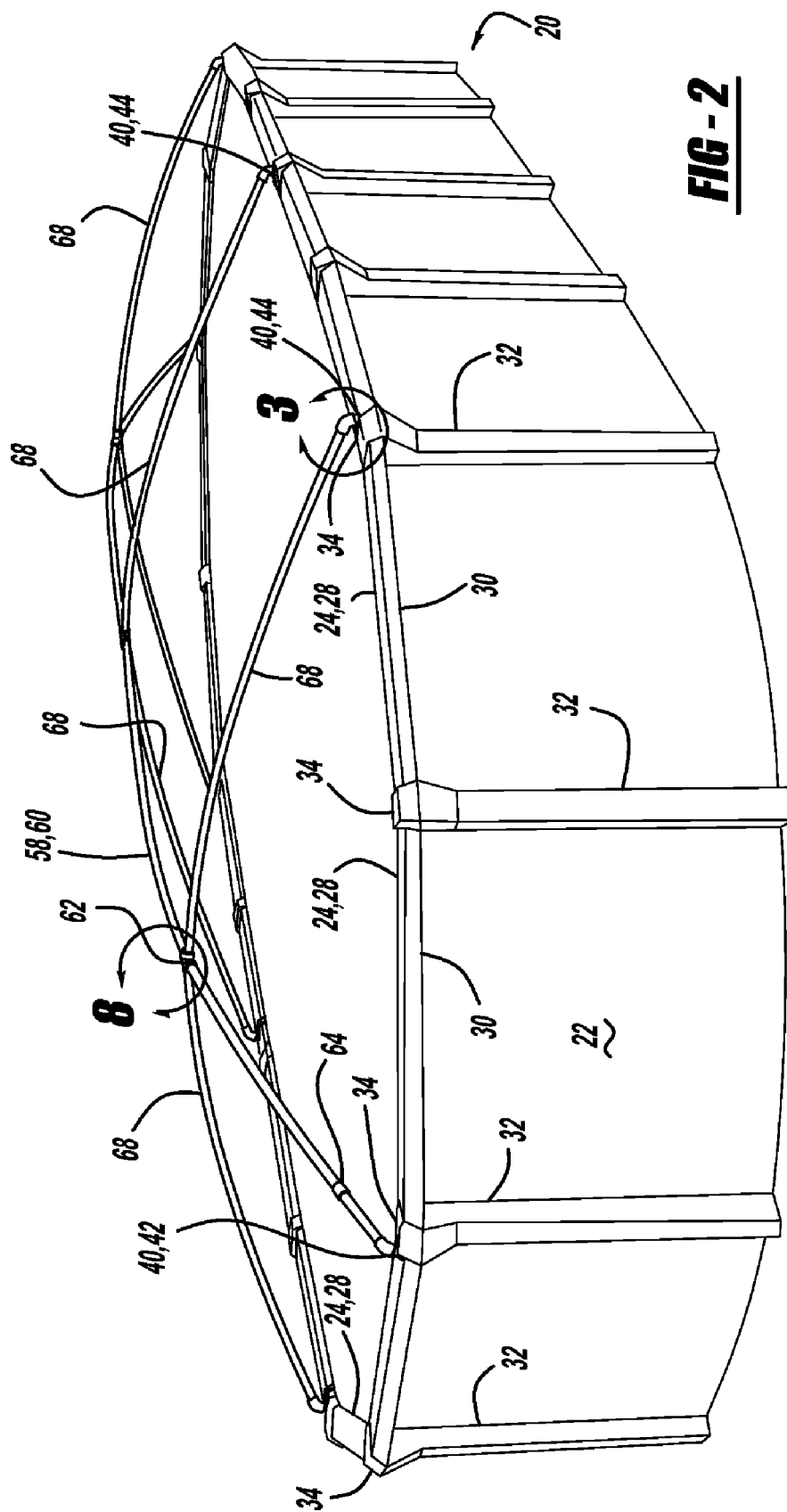
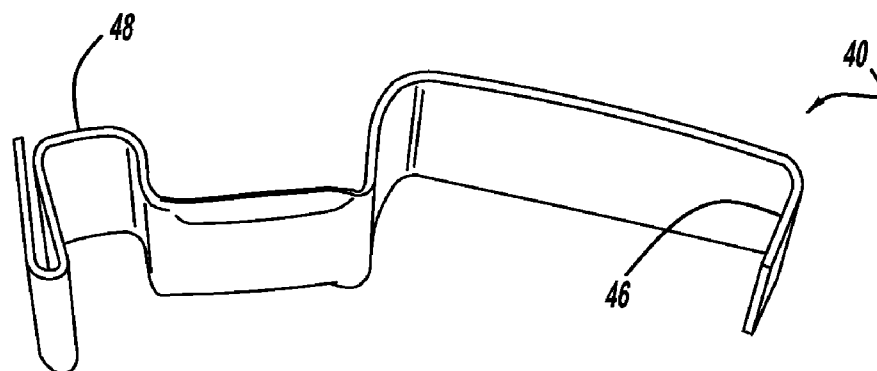
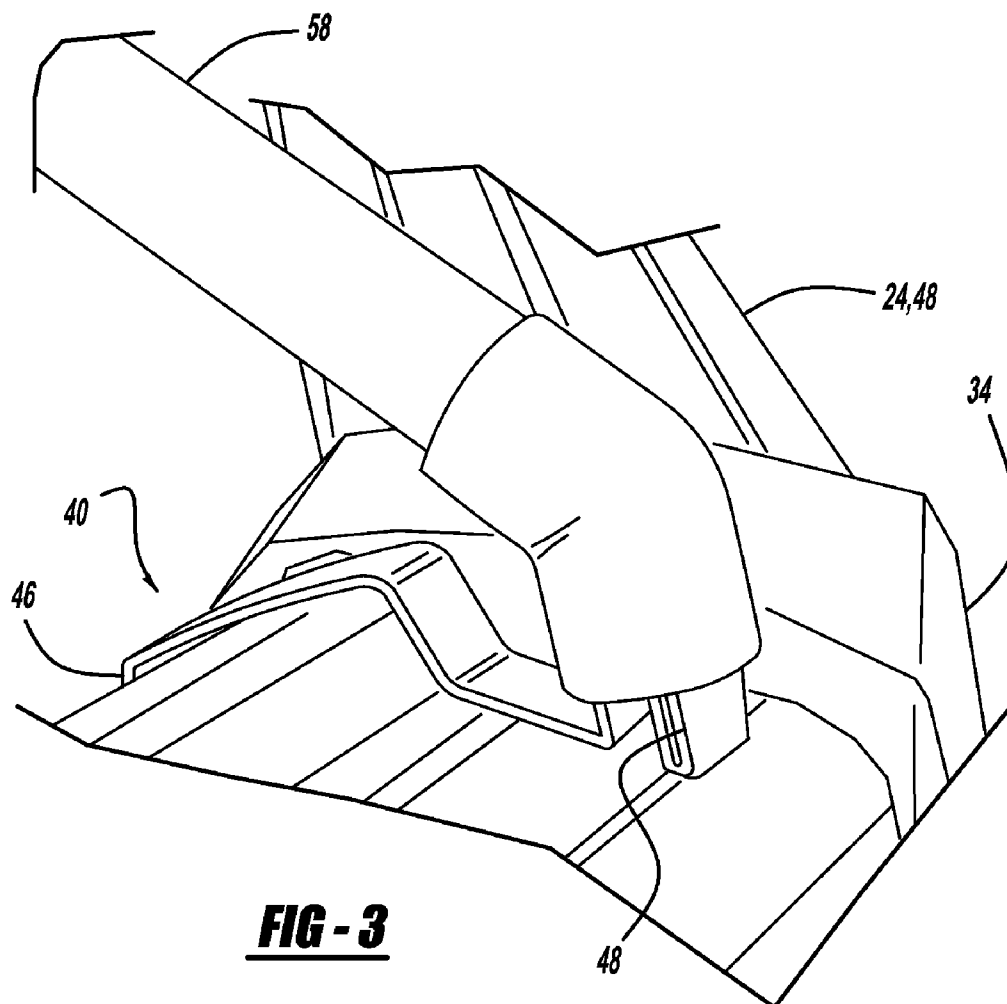
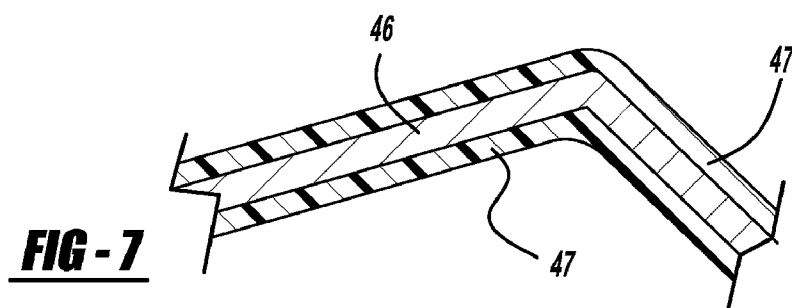
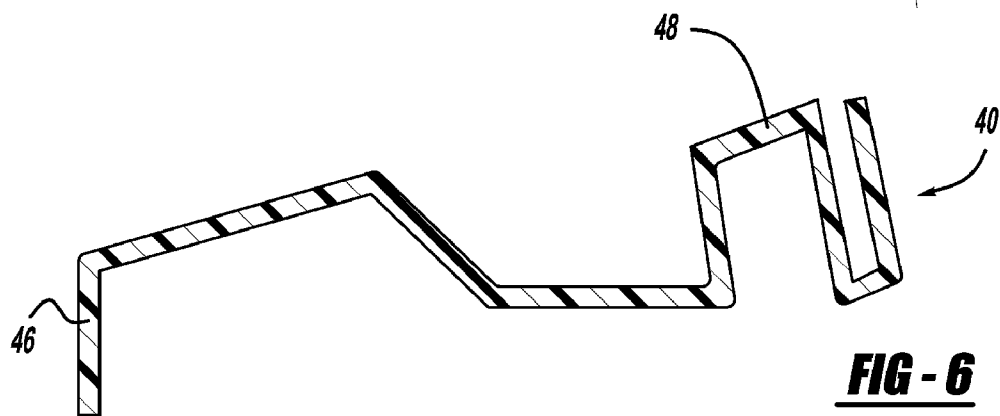
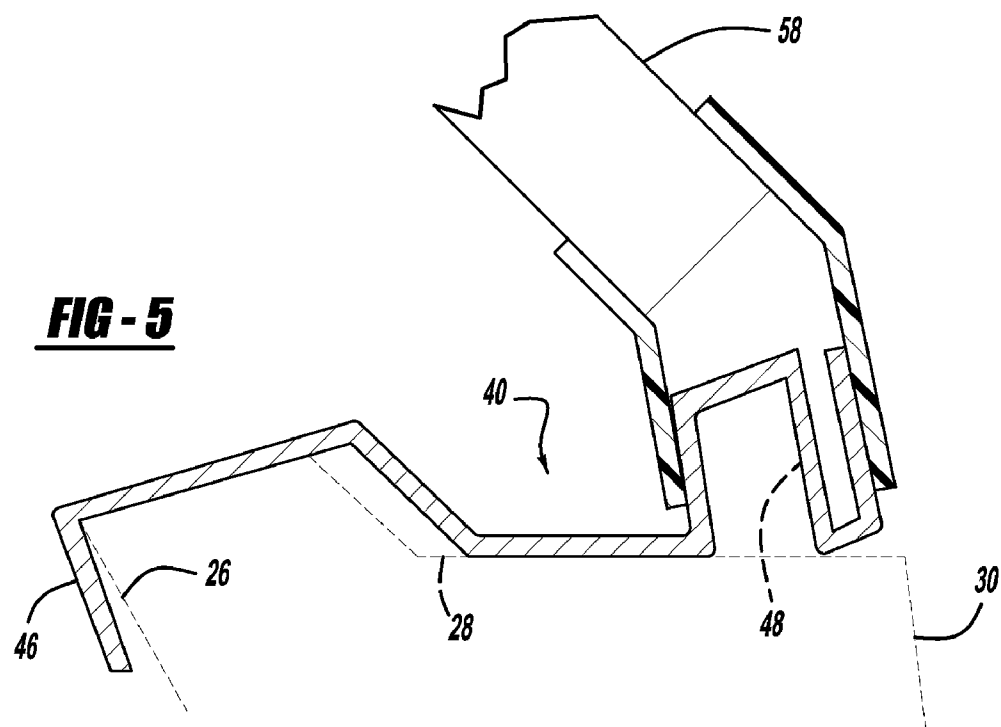
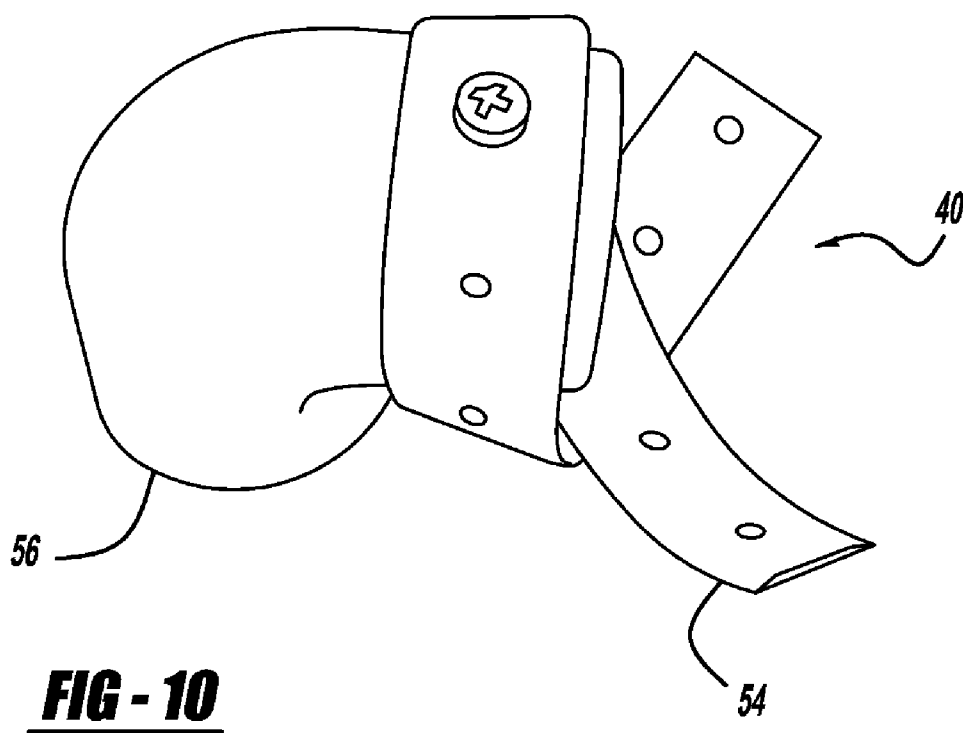
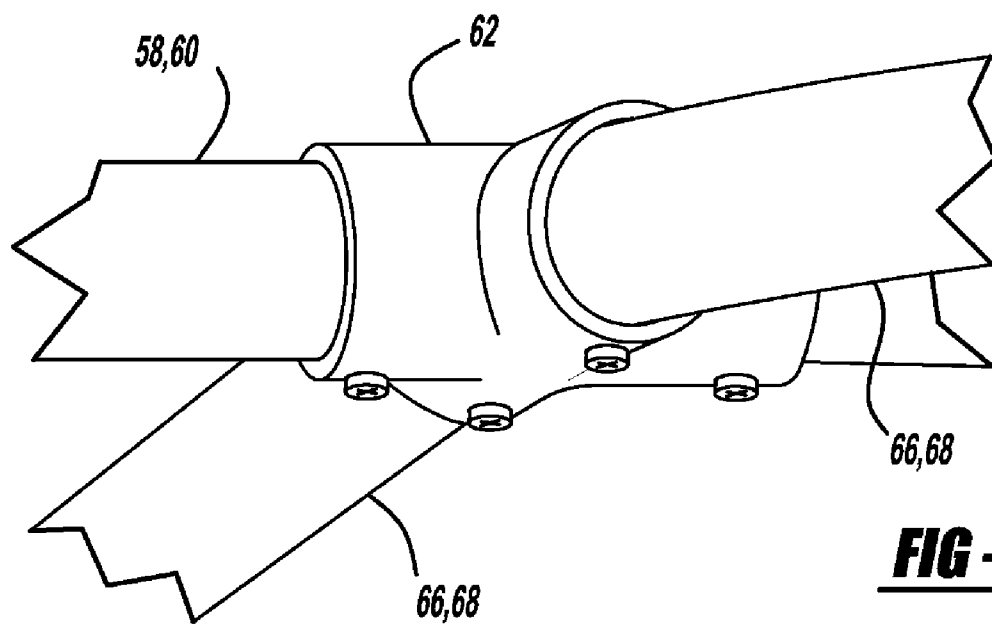


FIG - 2







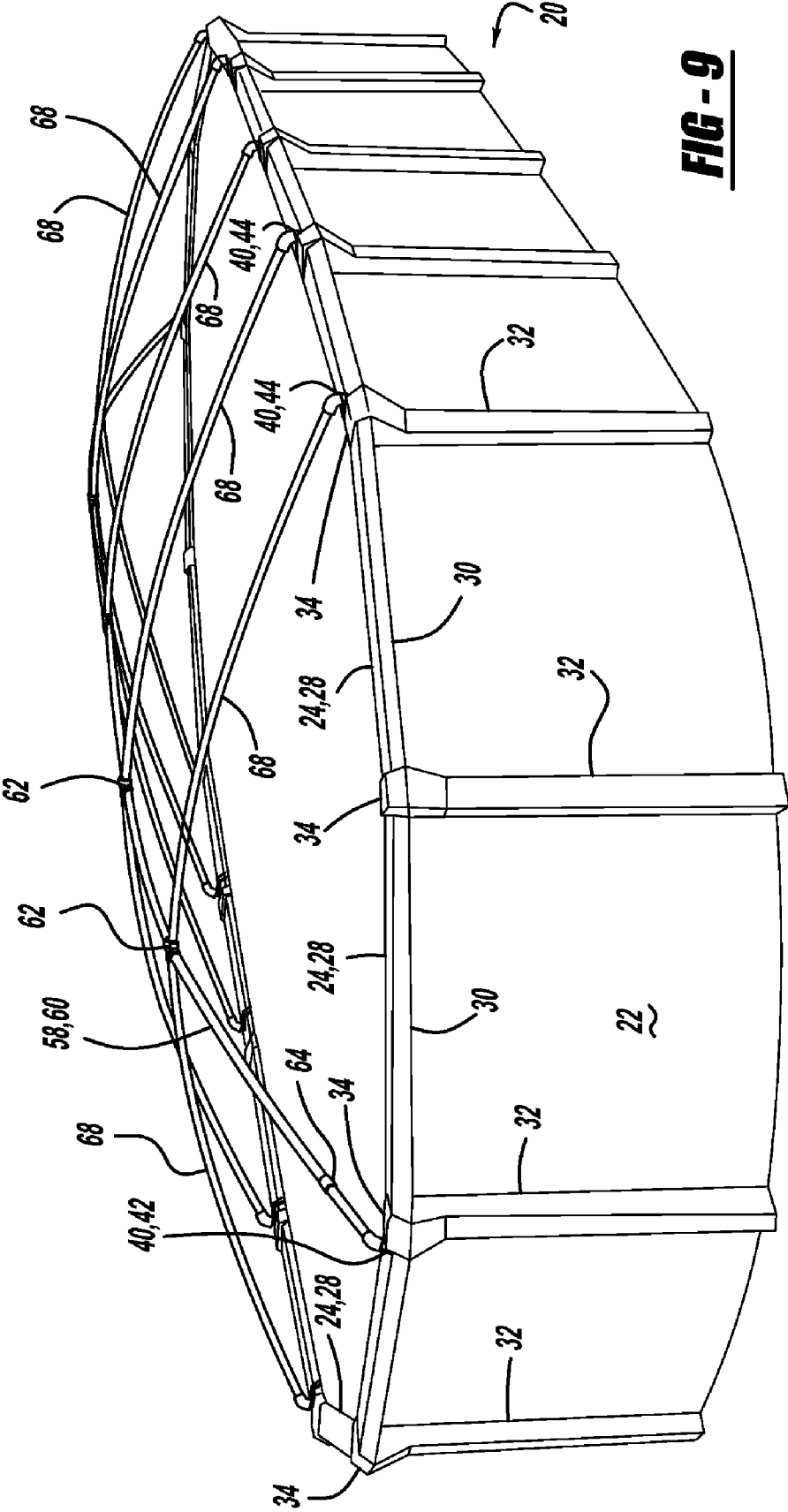


FIG - 9

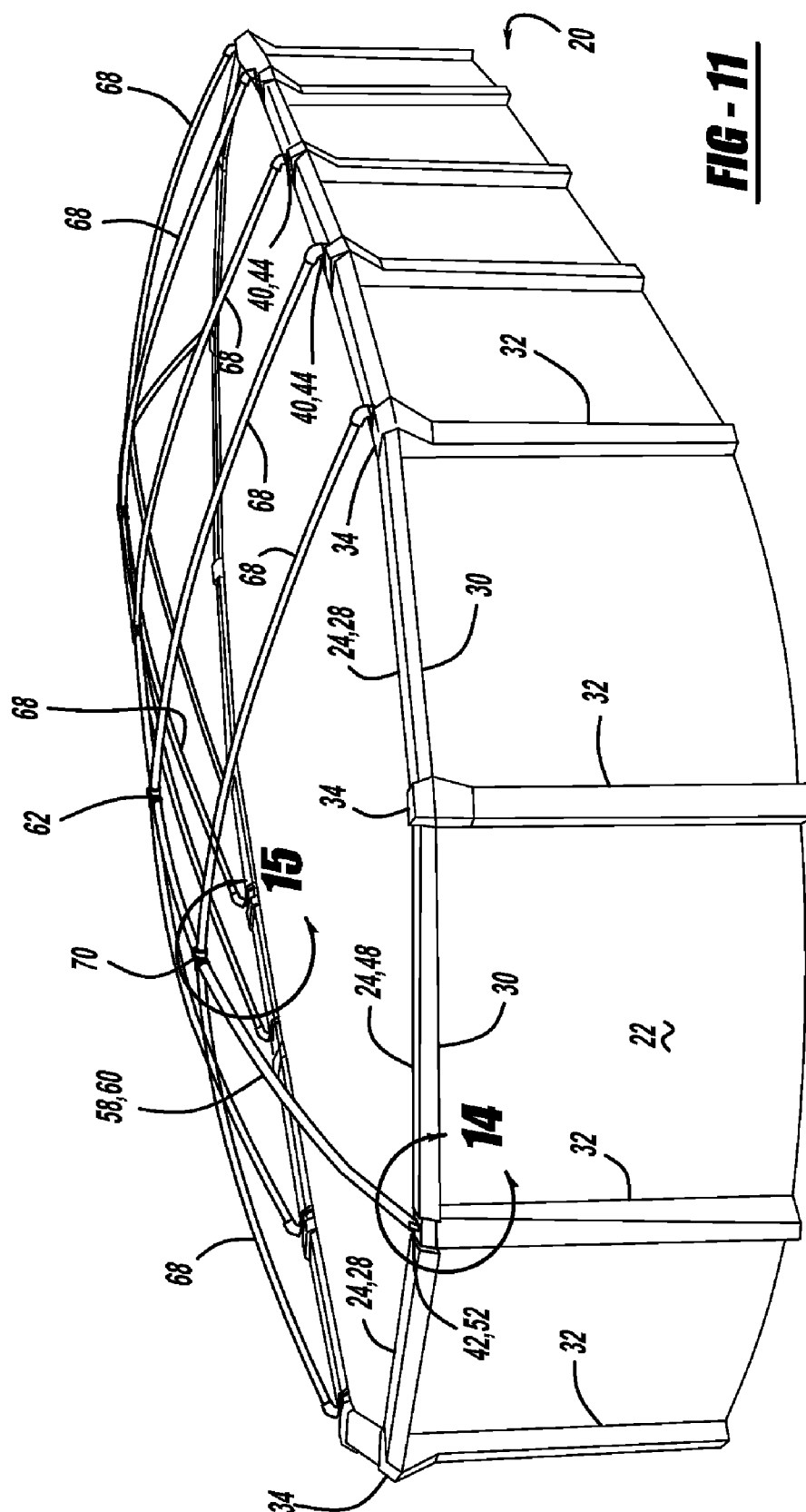
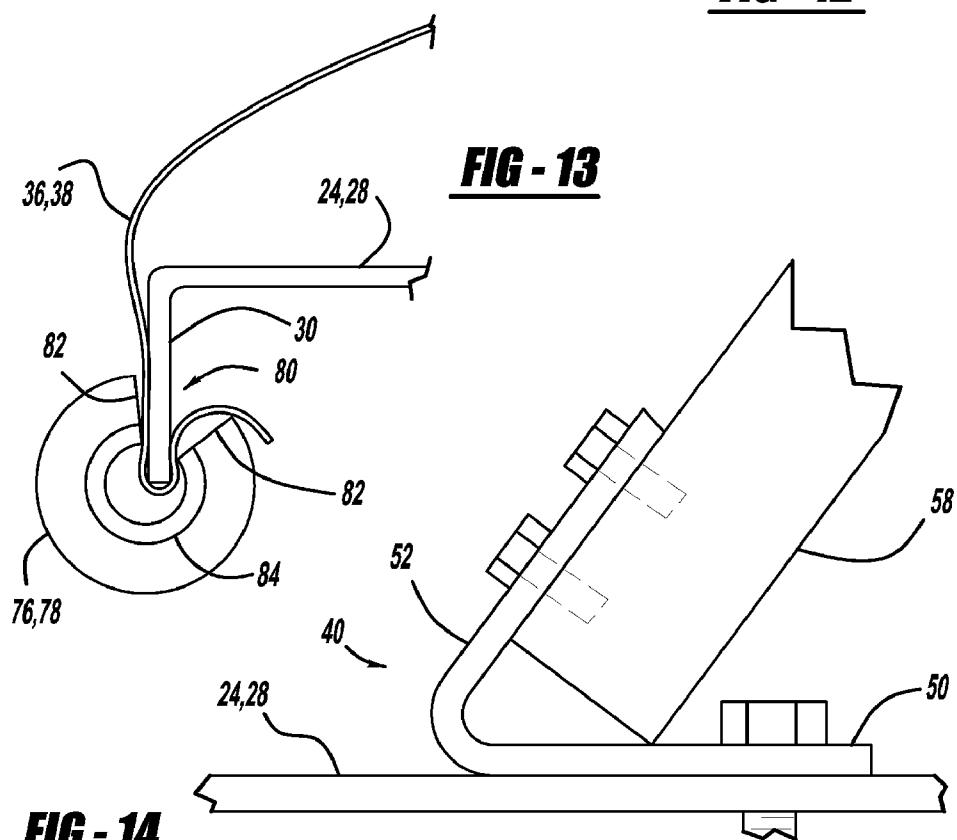
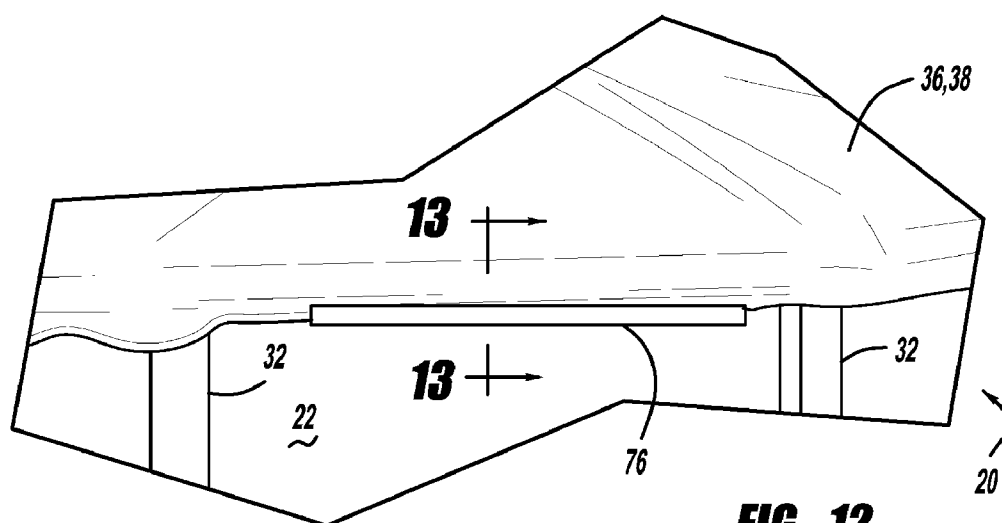


FIG - 11



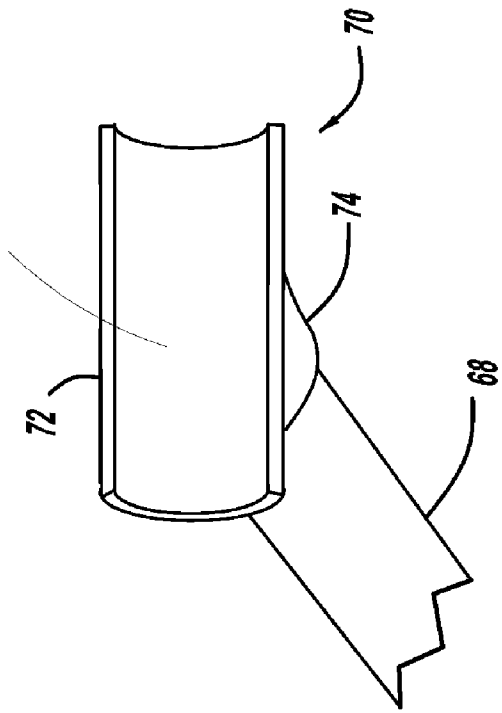
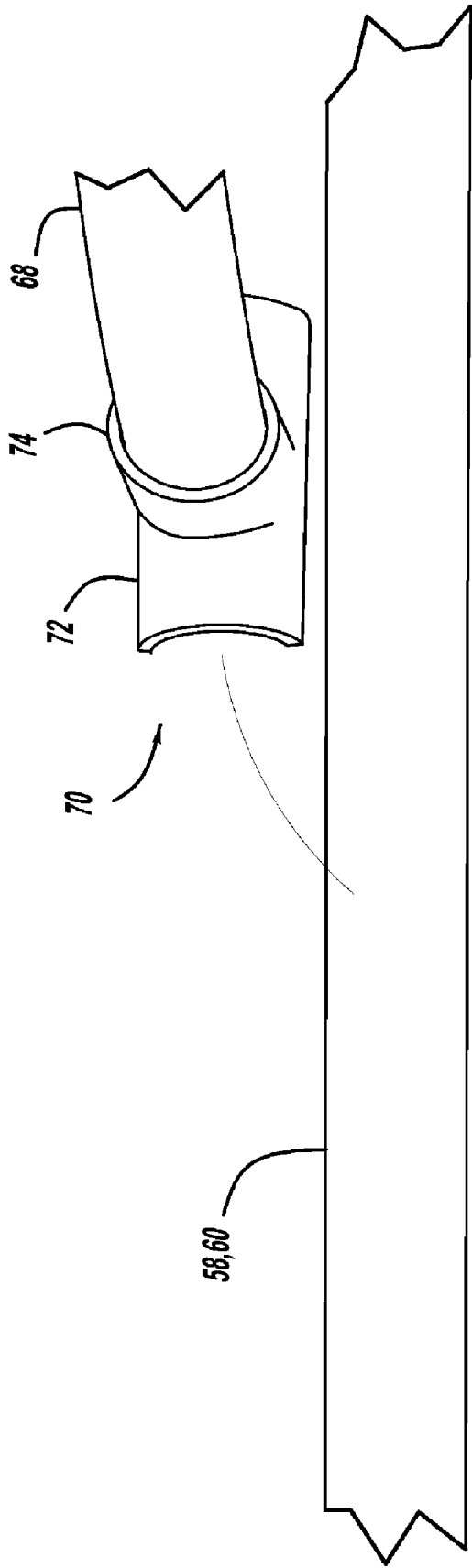


FIG - 15

COVERED SWIMMING POOL AND FRAME

BACKGROUND

[0001] Numerous swimming pools exist. They provide a means for recreation and enjoyment to many people. However, they require regular maintenance. Pool use is often seasonal. During the off-season it is desirable to retain water within the pool. This avoids draining and refilling a pool. In order to avoid draining and refilling a pool, the pool must be covered during the off-season. This will prevent contamination caused by insects, leaves, animals, debris and the like.

[0002] Typically, a pool is covered with a plastic tarp. Under the tarp cover one or more air filled balls or pillows are usually placed. They provide support for the cover and reduce the possibility of damage caused by expanding ice. Traditional pool covers are secured to the pool by a rope or cable securing the cover edge to the pool or by weights hung from eyelets near the edge of the cover. The resulting cover surface usually contains valleys which accumulate water and debris. The debris often tends to rot the cover. When it is desired to remove the cover substantial amounts of water usually need to be pumped out of the valleys and the cover surface usually needs to be power washed to remove accumulated debris and algae. While the cover is on the pool it is often subjected to damaging wind gusts at the edges. The edges of the cover usually remain open to wind. The wind gusts can easily damage or destroy the cover.

[0003] Current pool covers are relatively expensive to manufacture. They require substantial time to install. They require substantial time to remove. Once removed, swimmers can again enjoy use of the pool. Unfortunately, during hot weather swimmers are often attacked by numerous insects. It would be desirable to replace the pool cover with a screen bowed above the pool surface to protect swimmers from insects.

[0004] There is a need for a covered swimming pool, including a frame structure, having the following features. The cover would be cambered over the pool to avoid accumulation of water, debris and other contaminants upon the surface of the cover. The cover and frame would be easily and quickly installable and removable. The cover would not be subject to wind damage or rot. The cover would avoid the need to pump water out of its upper surface and to power wash it at the time of removal. The cover and frame would not have a tendency to fall into the pool during installation and removal. The cover and frame would be usable upon pools having multiple shapes such as round, oval, square, rectangular and S. shaped shapes. The cover and frame should be able to be manufactured at a relatively low-cost by using commonly available low-cost parts.

SUMMARY

[0005] These needs are satisfied by the covered swimming pool, the swimming pool cover frame and the method for covering an aboveground swimming pool described herein.

[0006] An aboveground swimming pool is defined by one or more walls. One wall may define a circular, elliptical or oval pool. Multiple walls may define a square or rectangular pool. There are also other shapes to aboveground swimming pools such as kidney shapes and S. shapes. Aboveground pools have a rail fixed to their upper periphery. The rail and pool walls are supported by vertically oriented pillars.

[0007] A covered swimming pool is comprised of an aboveground swimming pool, two spine brackets, a plurality of pairs of rib brackets, a flexible spine, a plurality of flexible rib pairs and a cover. The spine brackets are mounted to opposing ends of the rail. They should be mounted along the longest dimension of the pool. The brackets of each respective rib pair are mounted to opposing ends of the rail. The length of the flexible spine is greater than the distance between the spine brackets. The spine is attached to the spine brackets. The extra length of the spine compared to the distance between the brackets allows the spine to be bowed above the pool. Each rib of each rib pair is transversely attached at one end to the spine and at the other end to a rib bracket. Each of the ribs forming a rib pair is linearly aligned with each other. The combined length of each rib pair is greater than the distance between the pair of opposing rib brackets to which the rib pair is attached. This allows the rib pair to be bowed above the pool. The cover is draped over the spine, ribs and rail.

[0008] A plurality of cover clips are used to attach the cover to the rail. Each cover clip is comprised of a tubular body and a flexible protective membrane. The tubular body has a lengthwise slit defining a pair of clamping surfaces. The flexible protective membrane is fixed to the clamping surfaces. The optimum length of a cover clip is the distance between two adjoining pillars between which the clip is to be positioned. The cover is secured to the rail between the clamping surfaces of the clips. By using clips with the optimum length the cover edges are protected from wind gusts.

[0009] In order to minimize manufacturing cost commonly available parts may be used. The ribs and spine should be fabricated from plastic pipe. The brackets may be common rain gutter brackets. The cover clips may be fabricated from plastic pipe also.

[0010] The optimal number of rib pairs for maximum wind protection has been found to be five. A centrally positioned inner rib pair should have a longer length than the other rib pairs. The difference between the length of the centrally positioned inner rib pair and the distance between the rib brackets attaching that rib pair to the rail should be greater than the differences between the respective lengths of the other rib pairs and the distances between the rib brackets to which they are attached. This will cause a centrally positioned high point of the rib and spine assembly to be formed along the centrally positioned inner rib pair.

[0011] The spine should be formed from a plurality of plastic pipes joined together. One joint should be formed near what will be the center of the pool with a socketed connector. Socketed connectors include pipe unions and four-way socketed pipe connectors. The pool center joint should be formed with a four-way socketed pipe connector. Two of the four sockets are used to combine spine pipes. The other two of the four sockets are used to transversely attach a central rib pair. The four-way socketed connectors should be attached to the spine pipes with screws rather than glue. This permits disassembly into components which are not extraordinarily long. However, the joint formed is not as strong as a contiguous piece of pipe would be. Four-way socketed connectors may also be positioned along the spine, by forming the spine from pieces of pipe attached to the sockets, such that the unused socketed connectors may be used to transversely attach the rib pairs to the spine.

[0012] The use of four-way socketed connectors for attaching ribs to the spine does not result in the strongest available rib-spine structure. This is because separate rib and spine pieces would be screwed into the sockets of the four-way socketed connectors. Thus, the spine does not have maximum strength because it consists of several pieces screwed together rather than one continuous piece of plastic pipe. To enhance spine strength rib receptacles should be attached to unbroken spine elements and the rib receptacles should be employed to attach the ribs to a continuous piece spine element.

[0013] Each rib receptacle is comprised of a semi cylindrical shell and a socket. The semi cylindrical shell is formed to mate with the spine. The socket is adapted to receive a rib. The rib fits into the socket. The socket projects from the semi cylindrical shell. The shell may be glued to a spine element thereby providing a socket for attaching a rib without interrupting the integrity of the spine element. A rib receptacle may be easily fabricated from a plastic four-way socketed pipe connector. The four-way connector is cut in half along a longitudinal axis. This provides the described geometry for a rib receptacle.

[0014] The upper surface of the rib-spine assembly should be smooth. This can be accomplished by attaching the spine elements and ribs to connectors with screws positioned on the underside, relative to the ultimate positioning over the pool, of the connectors. A smooth upper surface of the rib-spine assembly is needed in order to minimize damage to the cover during use. Often the cover is subjected to high wind gusts causing it to shift with extreme force. Exposed hardware on the top surface of the spine-rib assembly may easily damaged the cover.

[0015] Optimum stability is achieved by mounting the brackets over the pillars. The pillars are usually covered by a cap. The cap is usually easily removable. The cap should be removed and the bracket mounted in the vacated position. On the other hand, the caps may be left in place and the brackets mounted offset from the pillars for quicker and easier installation and removal of the swimming pool cover frame formed by the ribs and spine.

[0016] Several different types of brackets may be used. One type is or is similar to a common rain gutter bracket. Such a bracket is comprised of a hook member and a head member. The hook member is adapted to be secured to an inner aspect of the rail. The head member extends from the hook member. The hook member is adapted to be secured to an inner aspect of the rail. The head member is adapted to fit to and secure a pool cover assembly structural member. The term pool cover assembly structural member includes ribs, spines, spine elements, four-way socketed pipe connectors, pipe unions and elbows. The hook member is secured to the rail. The head member is attached to a pool cover assembly structural member.

[0017] A second type of bracket is comprised of a horizontal bracket member and a vertical bracket member. The horizontal bracket member is adapted to be secured to a top surface of the rail. The vertical bracket member forms an acute angle with the horizontal bracket member. The vertical bracket member is adapted to fit to and secure a pool cover assembly structural member. The horizontal bracket member is mounted to the top surface of the rail. The vertical bracket member is attached to a pool cover assembly structural

member. This type of bracket provides the strongest pool cover frame wind protection when the bracket is positioned over a pillar.

[0018] Another type of bracket is comprised of a flexible strap and a socketed elbow. The flexible strap is adapted to be secured to the rail. The socketed elbow is attached to the flexible strap. The socketed elbow is adapted to fit to and secure a pool cover assembly structural member. To use this type of bracket the flexible strap is mounted to the rail and the socketed elbow is attached to a pool cover assembly structural member. In order to achieve optimal cambered bowing the spine and ribs may terminate with an optional pipe elbow connected to a bracket.

[0019] During the swimming season the off-season cover may be replaced by a screen. The screen would form a protective enclosure over the pool. This protective screen enclosure would prevent insects and debris from contacting swimmers within the pool. It would also be able to withstand substantial wind gusting.

[0020] The structure described may be used for covering an aboveground swimming pool defined by one or more walls, wherein the pool has a rail fixed to the upper periphery of the one or more walls. Two spine brackets are mounted to opposing ends of the rail. A plurality of pairs of rib brackets are mounted to the rail such that the brackets of each respective rib pair are mounted to opposing ends of the rail. A flexible spine fabricated from plastic pipes joined together by a socketed connector is attached to the spine brackets. The length of the flexible spine is greater than the distance between spine brackets. This allows the spine to be bowed above the pool. A plurality of flexible rib pairs fabricated from plastic pipe are transversely attached at one end to the spine and at the other end to a rib bracket. The combined length of each rib pair is greater than the distance between the pair of opposing rib brackets to which the rib pair is attached. Each of the ribs forming a rib pair is linearly aligned with each other. This configuration allows the rib pair to be bowed above the pool. A cover is draped over the spine, ribs and rail.

[0021] Optionally, after the cover is draped over the spine, ribs and rail a plurality of cover clips, as previously described, are selected. The cover is secured to the rail between the clamping surfaces of the cover clips.

[0022] The quickest and most economical way of implementing this method for covering a swimming pool is to use common rain gutter brackets used to secure rain gutters to buildings as the spine and rib brackets.

DRAWINGS

[0023] These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description, appended claims, and accompanying drawings where:

[0024] FIG. 1 is a perspective view of a covered swimming pool.

[0025] FIG. 2 is a perspective view of the covered swimming pool of FIG. 1, with the cover removed.

[0026] FIG. 3 is a broken away perspective view showing a rib from the pool cover frame shown in FIG. 2 attached to the rail of the pool with a bracket.

[0027] FIG. 4 is a perspective view of the bracket shown in FIG. 3.

[0028] FIG. 5 is a cross-sectional elevation view of the bracket, rib and rail shown in FIG. 3.

[0029] FIG. 6 is a cross-sectional elevation view of the bracket of FIG. 5.

[0030] FIG. 7 is a cross-sectional elevation view of an alternate embodiment of the bracket of FIG. 6 showing the bracket encapsulated with a protective material.

[0031] FIG. 8 is a broken away perspective view of a spine-rib joint of the pool cover frame shown in FIG. 2.

[0032] FIG. 9 is a perspective view of a pool cover frame mounted to a pool wherein the frame has five rib pairs.

[0033] FIG. 10 is a perspective view of an alternate embodiment of bracket used for mounting a pool cover frame structural member to the rail of a pool.

[0034] FIG. 11 is a perspective view of a pool cover frame mounted to a pool wherein the frame has five rib pairs and a spine bracket is mounted over a pillar of the pool.

[0035] FIG. 12 is a broken away elevation view of a covered swimming pool wherein the cover is secured to the rail of the pool with a cover clip.

[0036] FIG. 13 is a cross-sectional view of the cover clip and rail of the covered swimming pool of FIG. 12.

[0037] FIG. 14 is an elevation view of an alternate embodiment of a bracket used for mounting a pool cover frame structural member to the rail of a pool.

[0038] FIG. 15 is a broken away exploded elevation view of a pool cover frame spine wherein a pair of ribs are connected to the spine with a pair of rib receptacles formed from a four-way socketed connector which has been cut in half along a longitudinal axis.

DETAILED DESCRIPTION

[0039] An object of this invention is to provide a frame over an aboveground swimming pool 20 over which a pool cover 36 may be draped and secured.

[0040] An aboveground swimming pool 20 is defined by one or more walls 22. A rail 24 is affixed to the upper periphery of the walls 22. The rail 24 has an inner aspect 26, a top surface 28 and an outer aspect 30. The surfaces are shown in FIGS. 2, 3 and 5. Most aboveground swimming pools 20 have pillars 32 which support the walls 22 and the rail 24. The pillars are vertically oriented as shown in FIG. 2. The pillars 32 are spaced apart from each other. Caps 34 cover the areas where the pillars 32 meet the rail 24. The caps 34 are usually easily removable. Many different configurations of swimming pools 20 are constructed from these elements. These configurations include swimming pools 20 which are round, oval, elliptical, square, rectangular, kidney shaped and S. shaped. The invention described herein may be used with most aboveground swimming pools.

[0041] In the preferred embodiment of this invention the frame attached to the swimming pool 20 is comprised of two spine brackets 42, a plurality of rib brackets 44, a flexible spine 60 and a plurality of flexible rib pairs 66. The brackets 40, 42, 44 are used to mount the frame to the rail 24 of the

pool 20. The cover 36 is a typical cover, such as a plastic tarp, used to cover pools during the off-season. The cover 36, is draped over the spine 60, ribs 66, 68 and rail 24.

[0042] Preferably, the spine 60 and the ribs 66, 68 are fabricated from plastic pipe. 1¼ inch high-pressure PVC pipe has been determined to be optimal. 1 inch high-pressure PVC pipe also provides satisfactory results. The larger pipe provides better wind resistance to the frame and cover 36. Because the spine 60 needs to be conveniently stored during the swimming season it should be fabricated from separate spine elements which may be assembled and disassembled. The spine elements are simply pieces of pipe which are used to fabricate a longer flexible spine 60. The spine elements should be joined together at a point located nearest to the center of the pool 20 when the frame is installed. The joint is provided by a four-way socketed pipe connector 62. A four-way socketed pipe connector 62 is also known as a socket cross. Such a connection of two spine elements is shown in FIG. 8. That figure shows two spine elements 58, 60 and two ribs 68 from a rib pair 66 attached together with a four-way socketed pipe connector 62. Additional spine elements may be connected together with a pipe union 64. This is also known as a coupling. The pipe union 64 provides sockets only for the spine elements and not for the ribs 68. In order to provide maximum strength for the frame the number of spine element joints should be minimized. Ribs 68, rib pairs 66, spine elements and spines 60, four-way socketed pipe connectors 62 and pipe unions 64 are referred to as pool cover assembly structural members 58.

[0043] The ribs 68 and spine 60 should be attached to four-way socketed pipe connectors 62, pipe unions 64 and elbows with screws. This will allow the parts to be easily assembled and disassembled. It will also provide enough structural integrity to the frame so that frame parts will not fall into the pool 20 during installation. The screws should be three quarter-inch zinc coated screws. The zinc coating will inhibit corrosion. The screws should be attached to the underside of the four-way socketed pipe connectors 62, pipe unions 64 and elbows, such as the shown by the spine 60, rib 68 and connector 62 assembly shown in FIG. 8. By keeping the attaching screws on the underside of the frame the top side of the rib spine assembly will be smooth. This is especially important when the covered swimming pool 20 is subjected to high wind gusts. High wind gusts will cause the cover 36 to forcefully shift across the rib spine assembly. This may cause the cover 36 to rip and tear when the cover 36 is in direct contact with screws.

[0044] The flexible spine 60 and the ribs 66, 68 are attached to the rail 24 with brackets 40. Different types of brackets 40 may be used. Some types of brackets 40 allow the frame to be quickly installed and removed. Other types of brackets 40 provide the frame with maximum wind resistance.

[0045] For quick installation and removal the brackets 40 shown in FIG. 4 should be used. This type of bracket 40 also provides a low-cost option for covering a pool 20. This is because brackets 40 of that configuration are readily available as low-cost common rain gutter brackets. Rain gutter brackets are used to secure rain gutters to buildings. They can also be used to secure pool cover structural members 58 to the rail 24 of a pool. This type of bracket 40 is comprised of a hook member 46 and a head member 48. The hook

member 46 is adapted to be secured to the inner aspect 26 of a rail 24. The hook member 46 readily hooks onto the inner aspect 26 of the rail 24. The head member 48 should be oriented in a direction opposite to the orientation of the hook member 46, as shown in FIG. 4. The head member 48 is adapted to fit to and secure a pool cover assembly structural member 58. The head member 48 fits within the pool cover assembly structural member 58, as shown in FIG. 3. The head member should also have a spring element to cause a tight fit between the head member 48 and the structural member 58. FIG. 3 and FIG. 4 show a typical spring element contiguous with the head member 48. For added protection to the rail 24 and the cover 36 the body of the bracket 40 may be covered with a protective material 47 such as rubber. This is shown in FIG. 7.

[0046] The bracket 40 shown in FIG. 14 provides the best wind resistance. Preferably, this type of bracket 40 is installed over a pillar 32, as shown in FIG. 11. Installing the bracket 40 over a pillar 32 enhances the stability and ability to withstand wind gusts of the frame structure. In order to install the bracket 40 over a pillar often a pillar cap 34 must be removed. The caps 34 are typically easily removed. Upon removal of the cap 34 a section of rail 24 already bored to receive a fastener is often exposed. This type of bracket 40 is comprised of a horizontal bracket member 50 and a vertical bracket member 52. The horizontal bracket member 50 is adapted to be secured to the top surface 28 of a rail 24. The vertical bracket member 52 forms an acute angle with the horizontal bracket member 50. The vertical bracket member 52 is adapted to fit to and secure a pool cover assembly structural member 58. The vertical bracket member 52 may be adapted to be screwed directly onto the spine 60 or a rib 68, as shown in FIG. 14, or it may be attached directly, in a like manner, to a pipe elbow. In some pool configurations a 45° pipe elbow attached at one end to the bracket 40 and at the other end to the spine 60 or a rib 68 provides the desired cambering of the structural members 58. For all types of brackets 40 the spine 60 and ribs 68 may be directly attached to the brackets 40, or attached to pipe elbows wherein the elbows are directly connected to the brackets 40. In use, the horizontal bracket member 50 is mounted to the top surface 28 of the rail 24 and the vertical bracket member 52 is attached to a pool cover assembly structural member 58.

[0047] A third type of bracket 40 is shown in FIG. 10. This type of bracket 40 is comprised of a flexible strap 54 and a socketed elbow 56. The flexible strap 54 is adapted to be secured to the rail 24. Preferably, the flexible strap 54 is a linear piece of plastic having aligned holes, as shown in FIG. 10. The socketed elbow 56 is attached to the flexible strap 54. A screw may be used to make this connection. The socketed elbow 56 is adapted to fit to and secure a pool cover assembly structural member 58. The socketed elbow 56 should be a standard 45° elbow pipe fitting. In appropriate circumstances a 90° elbow pipe fitting may also be used. Such elbows may be readily secured to the spine 60 and the ribs 68 with three quarter-inch zinc coated screws positioned on the underside of the frame, as previously described. The ends of the flexible strap 54 which are not attached to the socketed elbow 56 should be secured to the inner aspect 26 of the rail 24. Thus an apparatus for securely receiving a pipe is mounted to the rail 24. The flexible strap 54 can also be used as a bracket 40 without a socketed elbow 56. In this configuration the flexible strap 54 is mounted to the inner

aspect 26 of the rail as previously described. The flexible strap 54 is wrapped in such a way that it will provide an opening to receive the spine 60 or a rib 68. An acceptable type of wrapping can be envisioned by removing the elbow from the bracket 40 shown in FIG. 10. When a socketed elbow 56 is not used the spine 60 or rib 68 is directly screwed to the strap 54, just as the elbow is screwed to the strap in FIG. 10.

[0048] The brackets 40 described may be used as spine brackets 42 or rib brackets 44. The spine brackets 42 are mounted to opposing ends of the rail 24. The spine brackets 42 should be mounted along the longest dimension of the swimming pool 20. This would be the longitudinal axis of a square or rectangular pool 20. In the case of a circular pool the spine brackets 42 may be mounted along any diameter of the pool 20. Each pair of rib brackets 44 are mounted to opposing ends of the rail 24. This will allow the ribs 68 of a rib pair 66 to be linearly aligned.

[0049] The flexible spine 60 is attached to the spine brackets 42. The length of the flexible spine 60 is greater than the distance between in the spine brackets 42 such that the spine 60 will be bowed above the pool 20.

[0050] Each rib 68 of each rib pair 66 is transversely attached at one end to the spine 60. The other end of each rib 68 is attached to a rib bracket 44. Each rib 68 of each rib pair 66 is linearly aligned with the other rib 68 of that rib pair 66, as shown in FIG. 11. The combined length of each rib pair 66 is greater than the distance between the pair of opposing rib brackets 44 to which that rib pair 66 is attached. This will cause the rib pair 66 to bow above the pool.

[0051] The ribs 68 can be transversely attached to the spine 60 with a four-way socketed pipe connector 62, as shown in FIG. 8. Such a connection is desirable for the rib 68 spine 60 intersection nearest to the center of the pool. This is because that type of connection facilitates easy disassembly and convenient storage of the ribs 68 and spine 60. A continuous non-interrupted spine 60 may be too long to be conveniently stored within many residential premises. It is preferred, however, to have no more than one break within the spine 60. Therefore, there is a need for a device which will not require the spine 60 to be broken and will enable the ribs 68 to be transversely attached to the spine 60. Such a device is a rib receptacle 70. A rib receptacle 70 is comprised of a semi cylindrical shell 72 and a socket 74. The shell 72 is formed to mate with the spine 60. The socket 74 is adapted to receive a rib 68. The socket 74 projects from the shell 72, as shown in FIG. 15. A rib receptacle 70 may be easily fabricated from a plastic four-way socketed pipe connector 62. The socketed four-way pipe connector 62 is cut in half along a longitudinal axis of the connector 62. This provides two parts which may be cemented to the spine 60. The angle at which the socket 74 projects from the spine 60 is adjustable by adjusting the position of the shell 72 around of the spine 60. After the rib receptacles 70 are mounted to the spine 60, the ribs 68 may be attached. Each rib 68 is attached at one end to a rib bracket 44 and at the other end to the socket 74 of a rib receptacle 70. This attachment may also be made with screws.

[0052] For many pools 20 three pairs of ribs 66, such as shown in FIG. 2, provide adequate cover 36 support. However, for maximum stability under extreme wind conditions five pairs of ribs 66 should be used, as shown in FIG. 11.

Also, brackets **40** comprised of horizontal bracket members **50** and vertical bracket members **52** should be used and should be mounted over pillars **32** of the pool **20**.

[0053] The degree of bowing of a rib pair **66** above the pool **20** is determined by the difference between the combined length of the rib pair **66** and the distance between the pair of opposing rib brackets to which the rib pair **66** is attached. A greater difference in length differential results in a greater degree of bowing. A centrally positioned inner rib pair **66** attaches to the spine **60** at a point nearer to the center of the pool **20** than the other rib pairs **66** when the spine **60** and the ribs **68** are attached to the rail **24** of the pool **20**. Preferably, the difference between the length of this centrally positioned inner rib pair **66** and the distance between the rib brackets **44** attaching that rib pair **66** to the rail **24** is greater than the differences between the respective lengths of the other rib pairs **66** and the distances between the rib brackets **44** to which they are attached. This results in a centrally positioned high point of the ribs **68** and spine **60** assembly along the centrally positioned inner rib pair **66**. Preferably, the degree of bowing of each rib pair **66** is lessened as the rib pairs **66** move further away from the centrally positioned inner rib pair **66**. Thus a convex cambered surface for receiving the pool cover **36** is created over the pool.

[0054] An aboveground swimming pool **20**, as previously described may be covered with a pool cover **36** in the following manner. Two spine brackets **42** are mounted to opposing ends of the rail **24**. A plurality of pairs of rib brackets **44** are mounted to opposing ends of the rail **24**. The brackets **40** may be common rain gutter brackets used to secure rain gutters to buildings. A flexible spine **60**, preferably fabricated from plastic pipes joined together by a socketed connector **62**, **64** wherein the length of the flexible spine **60** is greater than the distance between the spine brackets **42**, is attached to the spine brackets **42** such that the spine **60** is bowed above the pool **20**. A plurality of flexible rib pairs **66**, preferably fabricated from plastic pipe, are transversely attached at one end to the spine **60** and at the other end to a rib bracket **44**. The combined length of each rib pair **66** is greater than the distance between the pair of opposing rib brackets **44** to which the rib pair **66** is attached. Each of the ribs **68** forming a rib pair **66** is linearly aligned with each other such that the rib pair **66** is bowed above the pool **20**. The cover **36** is draped over the spine **60**, the ribs **68** and the rail **24**. The cover **36** may also be a screen. Preferably, the cover **36** is secured to the rail **24** of the pool **20** by a plurality of cover clips **76**. The cover clips **76** are as described below. The cover **36** is secured to the rail **24** between the clamping surfaces **82** of the cover clips.

[0055] Once the frame comprised of the spine **60** and ribs **68** is mounted to the rail **24** of a pool **20**, the cover **36** is draped over the spine **60**, ribs **68** and rail **24**. The cover **36** may be secured to the pool in a traditional manner. This involves hanging weights from eyelets along the periphery of the cover **36**, or stringing a cable through the eyelets and tightening the cable. However, the preferred approach to securing the cover **36** to the pool **20** is to secure the periphery of the cover **36** to the rail **24** between the clamping surfaces **82** of a plurality of cover clips **76**. Each cover clip **76** is comprised of a tubular body **78** and a flexible protective membrane **84**. Preferably, the tubular body **78** is comprised of PVC pipe. Other types of plastic pipe may also be

used. $\frac{3}{8}$ " PVC pipe is ideal. The tubular body **78** has a lengthwise slit **80** which defines a pair of clamping surfaces **82**, as shown in FIG. 13. The clamping surfaces **82** may be created by cutting a lengthwise slit **80** into a piece of PVC pipe. Objects placed between the clamping surfaces **82** are subject to a significant clamping force provided by the tubular body **78**. The flexible protective membrane **84** is fixed to the clamping surfaces **82**. The flexible protective membrane **84** may be a thin sheet of rubber folded in half so that the resulting width of the folded rubber slightly exceeds the inside diameter of the tubular body **78**. The folded sheet of rubber is inserted into the tubular body **78** through the lengthwise slit **80**. The cover **36** is secured to the rail **24** by positioning a cover clip **76** such that the flexible membrane **84** and the clamping surfaces **82** of the clip **76** surround the cover **36** and the outer aspect of **30** of the rail **24**, as shown in FIG. 13.

[0056] One cover clip **76** should be installed between each pair of pillars **32**. The length of each cover clip **76** should be approximately the distance between two adjoining pillars **32** between which the clip **76** is positioned. This configuration has been determined to provide good protection from the potential of wind forces to damage the cover **36**. When the cover **36** is secured in the traditional manner wind forces tend to destructively act upon any peripheral edge of the cover **36** which is not battened down. Also, the wind forces tend to cause the cover **36** to tear at locations wherein the cover **36** is clamped to the rail **24**. The cover clip **76** described herein minimizes the susceptibility of the cover **36** to wind damage because it minimizes the peripheral areas of the cover **36** exposed to wind and also provides protection to the cover **36** from the flexible protective membrane **84** where the clip **76** clamps the cover **36** to the rail **24**.

[0057] The frame described may also be used during the swimming season to provide a screened in enclosure for swimmers. Instead of using a plastic tarp as a cover **36**, a screen is used as a cover **36**. This will permit swimmers to swim within the pool, but yet be protected from contact with insects and debris.

[0058] One embodiment of this invention is a covered swimming pool, as described. Another embodiment is a swimming pool cover frame. The swimming pool cover frame is simply the covered pool without the pool. A swimming pool cover frame is comprised of two spine brackets **42**, a plurality of pairs of rib brackets **44**, a flexible spine **60** and a plurality of flexible rib pairs **66**. The elements and connections have been described above. The spine brackets **42** are intended to be mounted to opposing ends of the rail **24** of a pool **20**. The pairs of rib brackets **44** are intended to be mounted to opposing ends of the rail **24**. The flexible spine **60** should be fabricated from plastic pipe joined together by a socketed connector **62**, **64**. The length of the flexible spine **60** is greater than the distance between the spine brackets **42** when the spine brackets **42** are mounted to the rail **24**. This will permit the spine **60** to become bowed above the pool **20** when the spine **60** is mounted to the spine brackets **42**. The ribs **68** should also be fabricated from plastic pipe. Each rib **68** is transversely attached at one end to the spine **60** and the other end is adapted to be attached to a rib bracket **44**. Each rib **68** of each rib pair **66** is linearly aligned with its matching rib **68**. The combined length of each rib pair **68** is greater than the distance between the pair of opposing rib brackets **44** to

which the rib pair 66 is to be attached such that the rib pair 66 is bowed above the pool 20 when the rib brackets 44 are mounted to the rail 24. Preferably, the upper surfaces of the spine 60, ribs 68 and connecting joints 62, 64 are smooth. Preferably, the spine 60 and the ribs 68 each terminate with a plastic pipe elbow for connection to a bracket 40. The brackets 40 may be common rain gutter brackets used to secure rain gutters to buildings.

[0059] The covered swimming pool and the swimming pool cover frame described herein provide many advantages. The cover 36 of the pool 20 is cambered over the pool 20 in a convex configuration. This minimizes the accumulation of water and debris, as well as other contaminants, upon the surface of the cover 36. Therefore, after the pool 20 has been covered for a period of time, there is not a need to pump water out of the upper surface of the cover 36. There is also no need to power wash the cover 36 at the time of removal. The cover 36 is not likely to rot while it sits over the pool 20 during the off-season because water and other contaminants will slide off of it, rather than accumulate upon it. While the cover 36 is in place over the pool 20 wind damage to the cover 36 is unlikely. The cover 36 and the frame are easily and quickly installed and removed. The cover 36 and frame are not likely to fall into the pool 20 during installation or removal. The cover 36 and frame may be easily adapted to be used upon pools 20 having many different geometric shapes. The cover 36 and frame can be manufactured at a relatively low cost by using commonly available low-cost parts such as PVC pipes, PVC connectors, rain gutter brackets and common hardware.

[0060] Although the invention has been shown and described with reference to certain preferred embodiments, those skilled in the art undoubtedly will find alternative embodiments obvious after reading this disclosure. With this in mind, the following claims are intended to define the scope of protection to be afforded the inventor, and those claims shall be deemed to include equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

What is claimed is:

1. A covered swimming pool comprising:

an aboveground swimming pool defined by one or more walls, said pool having a rail fixed to the upper periphery of the one or more walls;

two spine brackets mounted to opposing ends of the rail;

a plurality of pairs of rib brackets, wherein the brackets of each respective rib pair are mounted to opposing ends of the rail;

a flexible spine attached to the spine brackets, the length of the flexible spine being greater than the distance between the spine brackets such that the spine is bowed above the pool;

a plurality of flexible rib pairs, each rib of each rib pair being transversely attached at one end to the spine and at the other end to a rib bracket, such that each of the ribs forming a rib pair is linearly aligned with each other, wherein the combined length of each rib pair is greater than the distance between the pair of opposing

rib brackets to which the rib pair is attached such that the rib pair is bowed above the pool; and

a cover draped over the spine, ribs and rail.

2. The covered swimming pool of claim 1, further comprising a plurality of cover clips, each said cover clip comprising:

a tubular body having a lengthwise slit defining a pair of clamping surfaces; and

a flexible protective membrane fixed to the clamping surfaces, wherein the cover is secured to the rail between the clamping surfaces.

3. The covered swimming pool of claim 1, wherein the spine and the ribs are comprised of plastic pipe.

4. The covered swimming pool of claim 1, comprising five rib pairs.

5. The covered swimming pool of claim 1, wherein the difference between the length of a centrally positioned inner rib pair and the distance between the rib brackets attaching that rib pair to the rail is greater than the differences between the respective lengths of the other rib pairs and the distances between the rib brackets to which they are attached, whereby a centrally positioned high point of the rib and spine assembly results therefrom along said centrally positioned inner rib pair.

6. The covered swimming pool of claim 1, further comprising a rib receptacle attached to the spine for receiving a rib and attaching that rib to the spine, said rib receptacle comprising:

a semi cylindrical shell formed to mate with the spine; and
a socket adapted to receive the rib, the socket projecting from the semi cylindrical shell;

wherein the rib is attached to a rib bracket on the rail and the socket of the rib receptacle.

7. The covered swimming pool of claim 1, wherein the upper surface of the rib spine assembly is smooth.

8. The covered swimming pool of claim 1, wherein the cover is a screen for preventing insects and debris from contacting swimmers within the pool.

9. The covered swimming pool of claim 2, wherein the pool walls and the rail are supported by vertically oriented pillars and wherein the length of each cover clip is approximately the distance between two adjoining pillars between which the clip is positioned.

10. The covered swimming pool of claim 9, wherein each bracket is positioned over a pillar.

11. The covered swimming pool of claim 1, wherein at least one of the brackets is comprised of:

a hook member adapted to be secured to an inner aspect of the rail; and

a head member extending from the hook member, said head member being adapted to fit to and secure a pool cover assembly structural member;

wherein the hook member is secured to the rail and the head member is attached to a pool cover assembly structural member.

12. The covered swimming pool of claim 1, wherein at least one of the brackets is comprised of:

a horizontal bracket member adapted to be secured to a top surface of the rail; and

a vertical bracket member forming an acute angle with the horizontal bracket member, said vertical bracket mem-

ber being adapted to fit to and secure a pool cover assembly structural member;

wherein the horizontal bracket member is mounted to the top surface of the rail and wherein the vertical bracket member is attached to a pool cover assembly structural member.

13. The covered swimming pool of claim 1, wherein at least one of the brackets is comprised of:

a flexible strap adapted to be secured to the rail; and
a socketed elbow attached to the flexible strap, said socketed elbow being adapted to fit to and secure a pool cover assembly structural member;

wherein the flexible strap is mounted to the rail and wherein the socketed elbow is attached to a pool cover assembly structural member.

14. The covered swimming pool of claim 2, wherein:

the cover clips are fabricated from plastic pipe;

the cover clips each have a length approximately equal to the distance between two rail supporting pillars between which that cover is secured to the rail;

the spine is fabricated from plastic pipes joined together by a socketed connector;

the ribs are fabricated from plastic pipe;

the upper surfaces of the spine, ribs and connecting joints are smooth; and

the spine and ribs each terminate with a plastic pipe elbow connected to a bracket.

15. The covered swimming pool of claim 14, wherein the brackets are common rain gutter brackets used to secure rain gutters to buildings.

16. The covered swimming pool of claim 14, comprising five rib pairs and wherein the difference between the length of a centrally positioned inner rib pair and the distance between the rib brackets attaching that rib pair to the rail is greater than the differences between the respective lengths of the other rib pairs and the distances between the rib brackets to which they are attached, whereby a centrally positioned high point of the rib and spine assembly results therefrom along said centrally positioned inner rib pair.

17. The covered swimming pool of claim 15, comprising five rib pairs and wherein the difference between the length of a centrally positioned inner rib pair and the distance between the rib brackets attaching that rib pair to the rail is greater than the differences between the respective lengths of the other rib pairs and the distances between the rib brackets to which they are attached, whereby a centrally positioned high point of the rib and spine assembly results therefrom along said centrally positioned inner rib pair.

18. The covered swimming pool of claim 14, wherein the cover is a screen for preventing insects and debris from contacting swimmers within the pool.

19. The covered swimming pool of claim 15, wherein the cover is a screen for preventing insects and debris from contacting swimmers within the pool.

20. The covered swimming pool of claim 16, wherein the cover is a screen for preventing insects and debris from contacting swimmers within the pool.

21. The covered swimming pool of claim 17, wherein the cover is a screen for preventing insects and debris from contacting swimmers within the pool.

22. The covered swimming pool of claim 14, further comprising a rib receptacle attached to the spine for receiving a rib and attaching that rib to the spine, said rib receptacle comprising:

a semi cylindrical shell formed to mate with the spine; and
a socket adapted to receive the rib, the socket projecting from the semi cylindrical shell;

wherein the rib is attached to a rib bracket on the rail and the socket of the rib receptacle.

23. The covered swimming pool of claim 6, wherein the rib receptacle is a plastic four-way socketed pipe connector cut in half along a longitudinal axis of the connector.

24. The covered swimming pool of claim 22, wherein the rib receptacle is a plastic four-way socketed pipe connector cut in half along a longitudinal axis of the connector.

25. A method for covering an aboveground swimming pool defined by one or more walls, wherein the pool has a rail fixed to the upper periphery of the one or more walls, said method comprising:

mounting two spine brackets to opposing ends of the rail;

mounting a plurality of pairs of rib brackets to the rail such that the brackets of each respective rib pair are mounted to opposing ends of the rail;

attaching a flexible spine fabricated from plastic pipes joined together by a socketed connector, the length of said flexible spine being greater than the distance between the spine brackets, to the spine brackets such that the spine is bowed above the pool;

transversely attaching a plurality of flexible rib pairs fabricated from plastic pipe at one end to the spine and at the other end to a rib bracket, wherein the combined length of each rib pair is greater than the distance between the pair of opposing rib brackets to which the rib pair is attached, and wherein each of the ribs forming a rib pair is linearly aligned with each other, such that the rib pair is bowed above the pool; and

draping a cover over the spine, ribs and rail.

26. The method for covering an aboveground swimming pool defined by one or more walls, wherein the pool has a rail fixed to the upper periphery of the one or more walls of claim 25, comprising:

selecting a plurality of cover clips, each said cover clip comprising:

a tubular body having a lengthwise slit defining a pair of clamping surfaces; and

a flexible protective membrane fixed to the clamping surfaces; and

securing the cover to the rail between the clamping surfaces of the cover clips.

27. The method for covering an aboveground swimming pool defined by one or more walls, wherein the pool has a rail fixed to the upper periphery of the one or more walls of claim 25, wherein the brackets are common rain gutter brackets used to secure rain gutters to buildings.

28. The method for covering an aboveground swimming pool defined by one or more walls, wherein the pool has a rail fixed to the upper periphery of the one or more walls of claim 26, wherein the brackets are common rain gutter brackets used to secure rain gutters to buildings.

29. A swimming pool cover frame for use on an above-ground swimming pool defined by one or more walls, said pool having a rail fixed to the upper periphery of the one or more walls, said frame comprising:

two spine brackets for mounting to opposing ends of the rail;

a plurality of pairs of rib brackets, wherein the brackets of each respective rib pair are for mounting to opposing ends of the rail;

a flexible spine attached to the spine brackets, said spine being fabricated from plastic pipes joined together by a socketed connector, the length of the flexible spine being greater than the distance between the spine brackets such that the spine is bowed above the pool when the spine brackets are mounted to the rail;

a plurality of flexible rib pairs, each rib being fabricated from plastic pipe, each rib of each rib pair being transversely attached at one end to the spine and at the other end to a rib bracket, such that each of the ribs forming a rib pair is linearly aligned with each other, wherein the combined length of each rib pair is greater than the distance between the pair of opposing rib brackets to which the rib pair is attached such that the rib pair is bowed above the pool when the rib brackets are mounted to the rail;

wherein the upper surfaces of the spine, ribs and connecting joints are smooth; and

wherein the spine and ribs each terminate with a plastic pipe elbow connected to a bracket.

30. The swimming pool cover frame of claim 29, wherein the brackets are common rain gutter brackets used to secure rain gutters to buildings.

31. The swimming pool cover frame of claim 29, comprising five rib pairs and wherein the difference between the length of a centrally positioned inner rib pair and the distance between the rib brackets attaching that rib pair to the rail, when the brackets are attached to the rail, is greater than the differences between the respective lengths of the other rib pairs and the distances between the rib brackets to which they are attached when those brackets are attached to the rail, whereby a centrally positioned high point of the rib and spine assembly results therefrom along said centrally positioned inner rib pair.

32. The swimming pool cover frame of claim 30, comprising five rib pairs and wherein the difference between the length of a centrally positioned inner rib pair and the distance between the rib brackets attaching that rib pair to the rail, when the brackets are attached to the rail, is greater than the differences between the respective lengths of the other rib pairs and the distances between the rib brackets to which they are attached when those brackets are attached to the rail, whereby a centrally positioned high point of the rib and spine assembly results therefrom along said centrally positioned inner rib pair.

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