

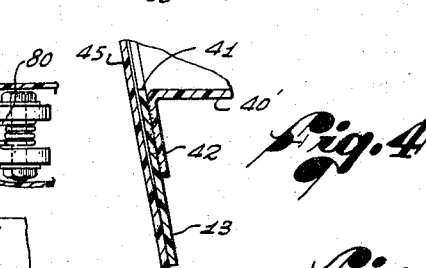
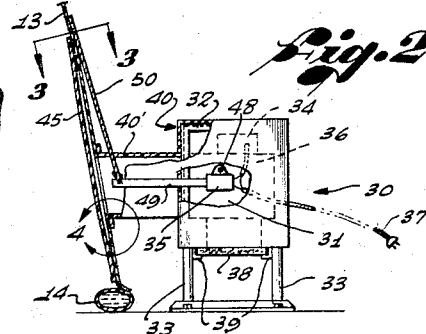
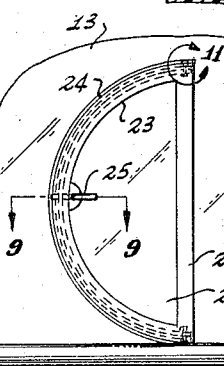
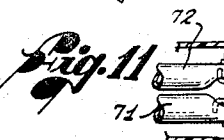
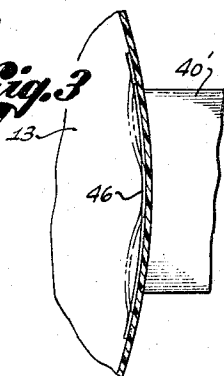
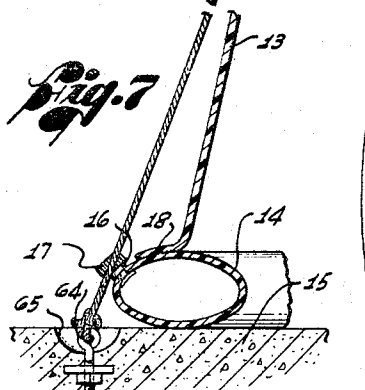
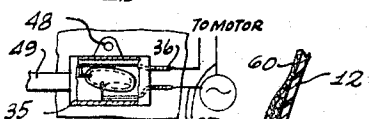
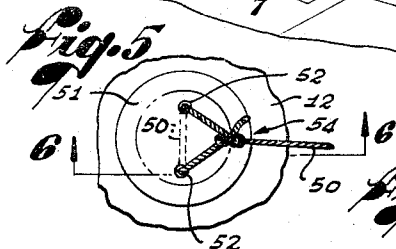
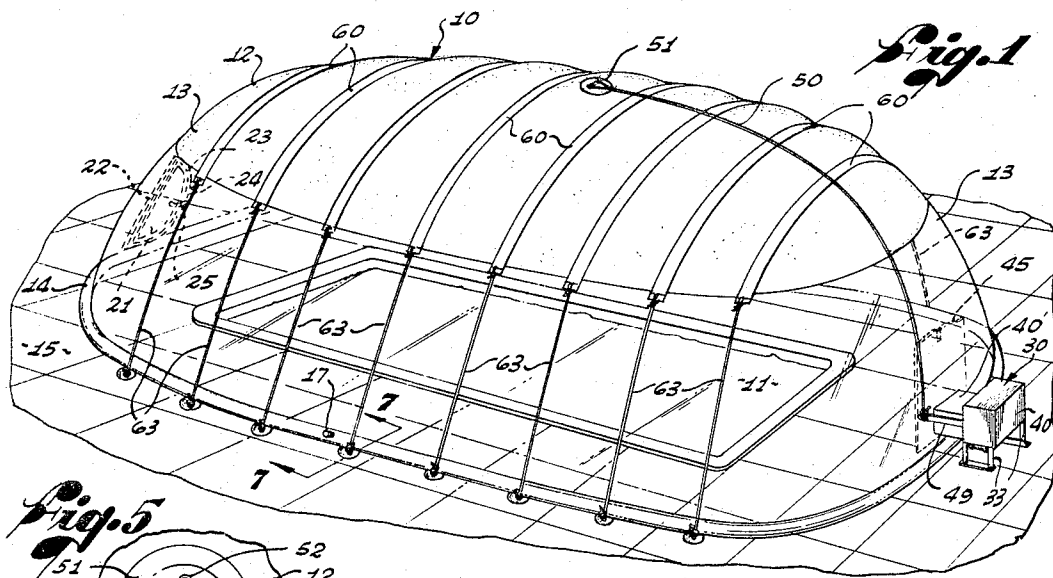
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3,353,309

INFLATABLE STRUCTURE

Original Filed May 25, 1965



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3,353,309

INFLATABLE STRUCTURE

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Continuation of application Ser. No. 458,609, May 25, 1965. This application Feb. 13, 1967, Ser. No. 615,839
16 Claims. (Cl. 52-2)

This patent application is a continuation of patent application Ser. No. 458,609, filed May 25, 1965, now abandoned.

This invention relates to dome type structures, and more particularly to a unique inflatable structure and associated control means therefor to provide a temporary enclosure over the top of another structure.

The invention has particular utility and will be described in use for swimming pools, but it will be apparent that it is useful to provide a dome-like covering for any structure.

Dome or hut type shells of rigid construction are known for use over swimming pools. Such structures are particularly advantageous during the fall and winter months, as they prevent leaves, dirt and snow from blowing or falling into the pool. Also, those that are not made of metal are effective to reduce heat loss from a heated pool so that persons can enjoy swimming in comfort and at times when it would otherwise be economically prohibitive to heat the pool.

However, such rigid structures have several disadvantages. One drawback is that they cannot readily be removed during warm months, when it is preferred to swim outdoors. If they are removed, they cannot be stored in a small space. Also, the materials of which they are made are adversely affected by the water that is in the air directly above the pool. In this latter connection, considerable amounts of water condense on the inner walls of the shell, causing them to rust if they are formed of metal, or to rot if they are made of wood and/or plaster construction.

In order to avoid the use of rigid structures and to employ, instead, a readily inflatable and deflatable, (and thereby readily assembleable and disassembleable) structure unsupported plastic domes, tied down at the corners have been used, in the past, to enclose swimming pools and other areas. Such domes have been pressurized by air at a pressure slightly in excess of atmospheric pressure. Such plastic domes were made of reinforced plastic because non-reinforced plastic domes, tied down at the corners, might tear under high wind loadings. Such reinforced plastic domes are very costly, and in addition, reinforced plastics are not manufactured in a glass clear condition. Additionally, pressure control in the inflatable structures of the prior art was not simple, economical and efficient.

In view of the foregoing, it is a major object of the present invention to provide an unsupported, inflatable dome-like structure made of a low cost, non-reinforced, sheet plastic having stabilizing and spaced reinforcing means preventing shifting even under high wind loadings, and preventing tearing of the plastic.

It is another object of the present invention to provide a pressure control means that is simple, economical, and efficient for regulating the pressure within an inflatable air structure made of a non-rigid material, such as flexible plastic sheet.

It is an object of my invention to provide a unique inflatable structure suitable as a temporary covering for another structure, which provides all the advantages but none of the disadvantages of the prior art.

It is another object of my invention to provide a unique inflatable shell structure with means for keeping it in-

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flated, but which can easily be deflated and removed and stored in a minimum of space.

A further object of my invention is to provide an inflatable structure suitable for use over a swimming pool, and which will not be adversely affected by water.

It is also an object of my invention to provide a unique inflatable shell structure comprising a minimum number of component parts of simple design and rugged construction.

The above and other objects and advantages of my invention will become apparent from the following description taken in conjunction with the accompanying drawings of an illustrative embodiment thereof, in which:

FIGURE 1 is a perspective view of an inflated plastic cover of my invention in position over a swimming pool, showing a blower assembly positioned at one end for supplying air to the interior of the cover, and showing the connection of a cord from the top of the cover to a bar for operating the control switch for the motor of the blower;

FIGURE 2 is a side elevational view of the blower assembly and a fragmentary sectional view of the portion of the inflatable cover into which air is introduced from the blower;

FIGURE 3 is a fragmentary sectional view taken along the line 3-3 of FIGURE 2;

FIGURE 4 is an enlarged fragmentary sectional view of the like numbered area indicated in FIGURE 2;

FIGURE 5 is a top plan view of the portion of the top of the plastic cover to which the switch control cord is connected, showing a reinforced plastic disc fused around its edge to the body of the cover, and showing how the line is connected through the disc;

FIGURE 6 is an enlarged fragmentary sectional view taken along the line 6-6 of FIGURE 5;

FIGURE 7 is a fragmentary sectional view taken along the line 7-7 of FIGURE 1, showing how guy lines are connected between support pins in the pool decking and the ends of reinforced plastic strips that are molded to the outer surface of the plastic cover, and showing in greater detail the construction of the water-filled tubular rim of the cover;

FIGURE 8 is a fragmentary and elevational view of the portion of the inflated cover at which the door is located;

FIGURE 9 is an enlarged fragmentary sectional view of the door construction taken along the line 9-9 of FIGURE 8;

FIGURE 10 is a schematic representation of a mercury switch means useable in my invention; and

FIGURE 11 is an enlargement of one corner of the door and door opening taken from FIGURE 8.

Referring to FIGURE 1, an inflatable structure 10 of my invention is shown in its inflated position over a swimming pool 11. The body of the cover 10 is shown to have an opaque top or ceiling portion 12, and a continuous wall portion 13 that is transparent. The lower edge of the wall 13 is formed of a tubular rim 14 which rests on the decking 15 surrounding the pool 11. The entire cover 10, i.e., the ceiling portion 12, the wall 13 and the tube 14, preferably is made of foldable plastic material, which may be any suitable non-porous thermosetting or thermoplastic material. One such pool cover I have made is made entirely of a vinyl plastic (such as polyvinylchloride or polyvinylacetate), in which the ceiling portion 12 and the tube 14 are made of opaque vinyl plastic, and the wall 13 is made of transparent vinyl plastic fused at its upper edge to the ceiling portion 12 and at its lower edge to the tube 14. Another construction is one which both the ceiling portion 12 and the wall 13 are constituted of a single piece of transparent vinyl.

The tube 14 is a weighted member. Preferably the tube is formed as a continuous tube, as by fusing the ends of an elongated tube together, and is provided with fitting through which the tube can be filled with water. As best seen in FIGURE 7, a fitting 16 is cemented or otherwise suitably secured in the wall of the tube 14, and is provided with a cap 17. The fitting 16 is located outwardly of the lower edge of the wall 13, which, as shown, is formed with an outer lip or flange 18 that is fused to the top portion of the tube 14. Water filling the tube forces its lower surface into sealing contact with the decking 14, so that air does not escape beneath the tube. The elongated tube may also be formed of a plurality of elongated contiguous tube sections, each with its own filling port, and such plurality of tube sections will form a continuous tube, functionally speaking.

The cover 10 at one end is provided with a door 21 shown as a generally semicircular element which is fused along its straight edge to a reinforced plastic strip 22 that is itself fused to the wall 13. The curved portion of the door 21 is provided with a reinforced plastic strip 23 fused thereto, which is adapted to fit against a similar reinforced strip 24 that is fused to the wall 13. A handle 25 is provided for locking the door in place against the reinforced strip 24. The strips 22-24 may, for example, be formed of nylon-reinforced vinyl strips.

At the opposite end of the cover 10 is a blower assembly 30 through which air is forced into the interior of the cover. Referring to FIGURES 1-4, the blower assembly 30 contains a housing 31 for a blower fan (not shown) which is supported in a frame 32 held above the ground as on support legs 33. A motor 34 is mounted on the fan housing 31, and a switch 35 is connected between motor leads 36 and an electric cord 37 which is adapted for connection to a power source, which may be the house current supply. When the motor 34 is operating, air is drawn from below the assembly through a filter 38 that is supported between the legs 33, as between angle strips 39 extending between the legs, and directed toward the adjacent wall 13 of the cover 10.

Channeling of air from the blower housing 31 into the interior of the cover 10 may be effected in a variety of ways. However, a preferred arrangement is by means of a plastic slipcover 40 for the frame 32 which covers the top, back and sides of the frame, and which is provided with a hollow extension 40' from the open end of the blower housing 31 to an opening 41 in the wall 13 of the cover 10. As best seen in FIGURE 4, the end of the extension 40' of the slipcover is provided with an outwardly extending lip or flange 42 which is fused to the wall 13.

Air from the blower is not permitted to pass horizontally through the wall 13. Rather, it is forced to travel upwardly along the wall 13. To this end, I provide an elongated rectangular panel 45 which spans the opening 41, and which is fused to the inner surface of the wall 13 along the bottom and side edges of the panel 45. Additionally, the center portion of the upper end of the panel 45 may be fused to the inner surface of the wall 13, as indicated at 46 in FIGURE 3.

As will be observed, air blown through the opening 31 strikes the confronting surface of the panel 45 and, since the lower end of the panel and the sides thereof are fused to the wall 13, the air forces the center portion of the panel 45 inwardly away from the wall 13, and thereby forces its way upwardly between the panel and the wall to escape past the upper end of the panel 45 into the interior of the cover 10.

The panel 45 and the wall 13 effectively function as a one-way valve, to admit air into the interior of the cover while the motor 34 is operating, but preventing air from escaping back between the panel and the wall when the motor is off. In this connection, the panel 45 is laid flat against the inner surface of the wall 13 when it is fused in place. Since the confronting surfaces of the panel

45 and the wall 13 are smooth plastic, the surfaces tend to adhere to each other. Furthermore, when the motor 34 is turned off, air inside the cover 10 presses against the inner wall of the panel 45 to urge it into intimate face-to-face contact with the confronting surface of the wall 13. Accordingly, when the motor 34 is turned off, the pressure will be higher in the enclosure than in the surrounding atmosphere; the confronting faces of the panel 45 and the wall 13 are effectively sealed together, however, to prevent backflow of air.

My invention includes means for automatically controlling the operation of the motor 34 so that it operates the blower to fill the interior of the cover 10, but is turned off when the cover is fully inflated. After the cover is fully inflated, the motor operates the blower to add air whenever necessary to keep it inflated, as when air pressure is decreased upon opening the door 21.

Automatic operation of the motor and blower is effected through the switch 35. The switch 35 preferably is a gravity-actuated switch, such as the well known mercury type switch. The switch housing is pivotally mounted at 43 on the end of the blower housing 31, and an elongated rod or arm 49 is secured at one end to the switch housing and extends through the slipcover 40 and alongside its extension 40' to a point adjacent the wall 13. The switch 35 is adapted to operate so that it is in the "off" condition when the arm 49 is horizontally disposed, and is in the "on" condition when the arm 49 is below the horizontal. FIGURE 10 shows the "off" condition.

The switch 35 may be of conventional construction in which contact terminals extending into the mercury capsule are connected to the motor leads 36 and the power cord 37. Thus, when the switch arm 49 is below the horizontal, the mercury flows into the portion of the capsule at which the contact terminals are located to effectively connect the power cord 37 to the motor leads 36, whereupon the motor 34 is set into operation to cause the blower to force air into the interior of the pool cover. When the arm 49 reaches the horizontal position, the mercury capsule is tilted to cause the mercury to move out of contact with the contact terminals, whereupon the motor 34 stops.

As will be apparent, the arm 49 constitutes a weighted member extending from the switch housing, and normally tends to tilt the switch downwardly so that the mercury will establish contact between the terminals of the motor leads 36 and the cord 37. In accordance with my invention, the arm 49 is allowed to remain below the horizontal while the pool cover 10 is being inflated, but is automatically raised to the horizontal position when the pool cover reaches its optimum height, i.e., at an optimum pressurization just above atmospheric, preferably between about 0.1 to about 0.2 p.s.i. above atmospheric. For this purpose, I arrange for the pool cover itself to raise the arm 49 to the horizontal position when it is fully inflated. One way to accomplish this, as illustrated in FIGURES 1 and 2, is to connect a flexible, but not stretchable, cord 50 between the outer end of the arm 49 and the midpoint of the pool cover 10. Referring to FIGURES 1, 5 and 6, a reinforced plastic disc 51 is fused around its edge over the midpoint of the ceiling 12 of the pool cover. The disc 51 is provided with a pair of openings 52 in the center portion thereof, and the end of the cord 50 is looped through the openings and tied, as indicated at 54.

It will be helpful at this point to explain how the pool cover is initially positioned over the pool and then inflated. It will be appreciated that the cover, being of plastic material, is folded and packed for storage. Preparatory to inflating the cover, it is unfolded and positioned over the pool, with the base tube 14 positioned around the pool on the decking 15. The tube 14 is then filled with water and capped at 17, and the cover 40 for the blower assembly 30 is fitted over the frame 32. At this time, the center portion of the pool cover overlays the

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pool 11, and in fact lies in the water. Also the arm 49 is below the horizontal (by virtue of its weight) and the switch 35 is tilted downwardly so that the mercury is in contact to establish electrical connection between the motor leads 36 and the power cord 37.

With the door 21 closed, the power cord 37 is plugged into the power source, and the motor 34 is immediately set into operation, whereupon air is forced into the interior of the pool cover as above described. The pool cover immediately starts inflating and the center portion thereof is lifted off the water and proceeds to rise. Air flow continues, and the pool cover continues to inflate, until it reaches its full height, at which time the cord 40 is extended to its full length, i.e., becomes taut, and the arm 49 is raised to the horizontal position. The motor then stops.

After the pool cover 10 is thus fully inflated, the motor 34 will remain stopped until the volume of air within the cover decreases. If, for example, the door 21 is opened by a person entering or leaving the interior of the pool cover, some air will escape. Thereupon, the pool cover deflates slightly, allowing the cord 40 to slacken and permitting the arm 49 to drop below the horizontal. Thereupon the motor 34 is set into operation again, and air is supplied to make up the deficiency and again inflate the pool cover to its maximum height, at which time the arm 49 is again pulled to the horizontal and the motor is stopped.

Regarding the switch 35, a mercury switch is ideally suited to prevent operation of the motor (after the cover 10 is fully inflated) until there is a significant loss of air. As will be appreciated, there is some volume change even when the door is closed, e.g., upon a sudden temperature decrease or with continuous evaporation of water from the pool. It is not desirable to have the motorcycle on and off with every minute loss of air. Since a mercury switch requires a definite movement to shift the mercury from one position to another, a few cubic feet of air would have to be lost before the cord 40 would slacken sufficiently and permit the arm 49 to lower sufficiently to set the motor into operation.

The pool cover 10 is made of sufficient size that persons entering the interior thereof can readily stand erect near the wall 13, at a substantial distance from the edge of the pool. Also, the ceiling portion 12 is sufficiently high when the cover is inflated to allow ample room for persons to dive off a board which may be mounted at one end of the pool.

The above-described construction of my pool cover is one that will maintain its position in fair weather and non-windy conditions. However, stability is insured, under adverse weather conditions, by providing means for anchoring the cover such that it cannot be dislodged or shifted, even in the presence of storms and high velocity winds. To this end, I provide a plurality of parallel strips 60 extending across the ceiling portion 12, and preferably form the strips 60 of reinforced plastic material (e.g., reinforced nylon) which are fused to the outer surface of the ceiling portion 12. Referring to FIGURES 1 and 7, each strip 60 at each end is formed with a flap bent back on itself and fused to the body of the strip, thereby forming a loop 61. The loop 61 is adapted to snugly receive a pin 62, and a line 63 is secured at one end around the pin 62, as by being threaded through an opening in the strip 60 above the loop 61.

At its lower end, the line 63 is secured to a pin 64 that is embedded in the decking 15. Preferably, and as indicated in FIGURE 7, the pin 64 does not extend above the decking, it is located in a small well 65 formed in its surface.

Thus, the line 63 connecting the ends of the strips 60 and the pins in the decking form tie lines or guy lines on the opposite sides of the pool cover 10. The guy lines 63 follow the surface contour of the wall 13 when the pool cover is fully inflated. With the pool cover thus sup-

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ported on each side, it is effectively anchored to the decking and thereby stabilized, and will readily withstand winds of very high velocities. The guy lines are of such a length that when the cover is fully inflated or even less than fully inflated, the guy lines are taut. The guy lines thus form ridges in the ceiling portion at the fully inflated position of the cover.

The strips 60 need not be fused to the ceiling portion 12 in order to stabilize the cover 10 against high winds. However, it is preferable to fuse the strips 60 to the ceiling portion 12 in order to maintain a predetermined spacing between strips (for reasons hereinafter to be detailed). As mentioned previously, contractions and expansion of the cover 10 take place frequently. If the strips 60 were not fused to the ceiling portion 12, frictional engagement between the strips 60 and the ceiling portion would occur with consequent wear and weakening of the ceiling portion of the cover. Also, by fusing strips of reinforcing material across the ceiling portion, if any tears should occur in the ceiling, they will be localized between such strips 60.

For these reasons, it is preferable to fuse the strips 60 over a sufficient portion of the ceiling so that the guy lines connect to the loops 61 of the strips 60 in a generally tangential manner with respect to the cover 10. (See FIGURE 7).

The spaced stabilizing strips 60 serve another very important function in the control of pressure within the cover 10 itself. If the domed portion of the cover 10 were made of sheet vinyl plastic, without stabilizing means, such cover could expand greatly in hot weather. For example, the volume of air within the cover 10 could be twice as great on a hot day compared to that on a cold day. Such expansion would cause the blower to turn off, and the internal pressure within the cover would well be lower than the external pressure due to a sudden gust of wind. Thus, in the event of gusty conditions and hot weather, a domed enclosure made of sheet plastic alone may sag greatly, or even, collapse. With the use of stabilizing strips, such as strips 60, and guy lines in combination therewith, the expansion between strips 60 spaced about 6' apart is perhaps about 5-7% of what it would be in an unsupported dome of 40' to 50' in length for the same weather conditions. Because the pressure excess in the enclosure or cover 10 is between 0.1-0.2 p.s.i. volume expansion of 5-7% will not cause any significant depressurization within the cover 10.

As previously mentioned, the door 21 is adapted to be securely locked in sealing relationship against the reinforced frame members 22, 24. Referring to FIGURE 9, the confronting edge portions of the reinforcing strips 23, 24 are adapted to be stiffened, as by curved metal tubes 71, 72 inserted therein. As shown, the tubes 71, 72 are arranged in slightly overlapping relation, and a curved strip 73 of soft plastic material is secured to the inner surface of the reinforced strip 23 of the door 21. The soft strip 73, which preferably is a sponge-like element, is positioned so that a portion thereof is compressed between confronting portions of the tubular members 71, 72 when the handle 25 is in the closed position for latching the door. In this connection, the inner end of the handle 25 is shown to engage the bulge in the strip 24 caused by the metal tube 72. In this manner, leakage of air around the closed door is avoided.

Plastic enclosures of the type described herein, are absorbers of heat; and air, within the enclosure can, on a sunny day, become quite hot. In order to provide a ready and economical way of cooling the air within the enclosure, I provide the following:

The door 21 is maintained under a spring tension which normally urges the door inwardly but the force exerted by the spring is such that it does not overcome the normal pressurization within the enclosure (0.1-0.2 p.s.i. above atmospheric) but exerts an inward force slightly less than the pressure exerted by the air within the en-

closure. One such example of a suitable spring means is a pair of springs 80 which bias the door 21 normally inwardly towards the door opening. See FIGURES 8 and 11 especially. Of course, other modes of spring-loading the door 21 may be employed.

The door 21, when left open, assumes a normal position just slightly apart from the frame 22, 24, e.g., 1 to 2 inches. When the door is left open, the blower will work constantly, at its maximum capacity to prevent any deflection of the enclosure 10, and the air thus continuously blown into the cover 10, will escape through the slightly open door, and will very quickly result in a lowering of the temperature of the air within the enclosure. When the air is sufficiently cooled, the door need only be manually closed, and the blower will turn off once proper pressure within the enclosure is reached.

From the foregoing, it will be apparent that various modifications can be made in the structure illustrated and described herein without departing from the spirit and scope of my invention. Accordingly, I do not intend that my invention be limited, except as by the appended claims.

I claim:

1. An inflatable structure comprising:

- a body member of foldable material having a rim adapted to releasably but sealingly engage a surface over which the body member is to be inflated, said body member having an opening near said rim through which to admit a gaseous fluid to raise the body member above the surface;
- supply means to force gaseous fluid through said opening to inflate said body member;
- control means operable from said body member to limit operation of said supply means when said body member is inflated;
- a door opening in said body member;
- a door having one edge thereof attached to an edge of said door opening;
- means for sealingly engaging said door with said door opening in said body member; and
- spring means in said door normally urging said door, when unlocking, to a closed position when said blower is non-operative, said spring means being insufficient in force to close said door, when unlocked, and when said blower is operative.

2. In combination:

- a body of foldable plastic material having an integral tubular rim to be placed adjacent an area to be enclosed, said rim being adapted to be filled with water to provide a weighted support base for the body, said rim when filled with water having its lower surface forced into sealing contact with said area to be enclosed, said body having an opening near the rim through which to force air beneath the body; and
 - a plastic flexible panel on the inner surface of said body, said panel covering said opening and being fused along its lower and side edges to said inner surface, whereby air entering said opening is directed above the opening between the confrontation surfaces of said panel and the body to escape past the upper end of said panel.
3. The structure of claim 2, including spaced, reinforced plastic strips affixed to the outer surface of said body, said strips extending across the ceiling portion of said body, each of said strips being adapted to have guy lines connected between each end thereof and the area adjacent said rim.

4. An inflatable structure to be placed on the decking around a swimming pool and inflated to provide a shelter within which persons can enjoy use of the pool, comprising:

- a body of foldable plastic material having an integral tubular rim to be placed on the decking around the pool, said rim being adapted to be filled with water

to provide a weighted support base for the body, said rim when filled with water having its lower surface forced into sealing contact with the decking, said body having an opening near the rim through which to force air into the body, said body also having a door through which persons can enter and leave the body when it is inflated;

- a blower assembly communicating with said opening and having a motor, said blower assembly including an elevated frame to be supported on the decking adjacent the opening in said body, and a plastic slip-cover over said frame having a tubular portion extending to said opening through which to force air into said body;
- a switch for connection to a power source and through which to effect operation of the motor; and
- means utilizing said body to control said switch so that the motor operates the blower assembly while the body is being inflated, and thereafter to maintain a generally constant volume of air within the body.

5. An inflatable structure to be placed on the decking or the like and inflated to provide a shelter comprising:

- a body of foldable plastic material having an integral tubular rim to be placed on the decking around the pool, said rim being adapted to be filled with water to provide a weighted support base for the body, said rim when filled with water having its lower surface forced into sealing contact with the decking, said body having an opening near the rim through which to force air into the body, said body also having a door through which persons can enter and leave the body when it is inflated;
- a blower assembly communicating with said opening and having a motor, said blower assembly including an elevated frame to be supported on the decking adjacent the opening in said body, and a plastic slip-cover over said frame having a tubular portion extending to said opening through which to force air into said body;
- a plastic panel on the inner surface of said body, said panel covering said opening and being fused along its lower and side edges to said inner surface, whereby air entering said opening is directed above the opening between the confronting surfaces of said panel and body to escape past the upper end of said panel;
- a switch for connection to a power source and through which to effect operation of the motor; and
- means utilizing said body to control said switch so the motor operates the blower assembly while the body is inflated, and thereafter when the volume of air within the body decreases.

6. An inflatable structure, inflatable by gaseous fluid from a fluid supply source, maintained in a substantially static fully inflated position comprising:

- stabilizing means extending over said inflatable structure when inflated to substantially prevent said inflatable structure from moving generally upwardly from a desired fully inflated position, said stabilizing means including a plurality of spaced reinforcing non-elastic and substantially non-stretchable strips of material, each affixed to at least a portion of the surface of said inflatable structure and held to a base adjacent said body member; and
- control means to limit the flow of gaseous fluid from said fluid supply source into said inflatable structure when said inflatable structure is in said fully inflated position and to increase the flow of gaseous fluid from said fluid supply source into said inflatable structure when said inflatable structure starts to deflate from said fully inflated position, said control means including means affixed to said inflatable structure which moves as a result of movement of a finite area between said reinforcing strips, said control means and said stabilizing means co-acting

to maintain said inflatable structure in a substantially static position.

7. The means of claim 6 wherein said reinforcing strips are flexible to follow the curvature of said inflatable structure.

8. The means of claim 6 wherein said stabilizing means comprises a plurality of spaced reinforcing strips extending over said inflatable structure whereby when said structure is inflated the ends of said reinforcing strips are adapted to be anchored to the ground adjacent said inflatable structure by guy wire means.

9. The means of claim 6 wherein said reinforcing strips are plastic and are fused to at least a portion of said surface of said inflatable structure.

10. The means of claim 6 wherein said reinforced strips are reinforced nylon.

11. An inflatable structure comprising:

a body member of foldable material having a rim adapted to releasably but sealingly engage a surface over which the body member is to be inflated, said body member having a roof section and having an opening through which to admit a gaseous fluid to raise the body member above the surface;

supply means to force gaseous fluid through said opening to inflate said body member;

stabilizing means extending over said body member when inflated to substantially prevent said body member from moving upwardly from its fully inflated position, said stabilizing means including a plurality of spaced reinforcing non-elastic substantially non-stretchable strips of material, each affixed to at least a portion of the surface of said body member and adapted to be held taut at the ground adjacent said body member; and

control means to limit the flow of gaseous fluid from a fluid supply source into said inflatable structure when said body member is inflated and to increase the flow of gaseous fluid from said fluid supply source into said inflatable structure when said body member starts to deflate, said control means including means affixed to said inflatable structure which moves as a result of movement of a finite area between said reinforcing strips, said control means and said stabilizing means co-acting to maintain said body member in a substantially static position.

12. The inflatable structure of claim 11 wherein said control means includes a cable means which is affixed to the apex of the finite area centrally disposed between a pair of reinforcing strips on said body member.

13. The inflatable structure of claim 11 wherein said strips of said stabilizing means are flexible.

14. The inflatable structure of claim 11 wherein said control means comprises (a) a flexible, non-stretchable cable, (b) a switch arm and (c) a switch operably connected to said supply means, said cable fixedly attached at one end to said finite area between said reinforcing strips and fixedly attached at the other end to said switch arm, said cable having a length such that said cable moves said switch arm to the "off" position when said reinforcing strips are fully extended and such that said cable moves said switch arm towards the "on" position when said reinforcing strips are less than fully extended to closely control the flow of said gaseous fluid into said body member from said supply means, whereby movement of said

body member from its fully inflated position is substantially limited.

15. An inflatable structure comprising in combination: a body member of foldable material having a rim adapted to releasably but sealingly engage a surface over which the body member is to be inflated, said body member having a roof section and having an opening through which to admit a gaseous fluid to raise the body member above the surface;

supply means to force gaseous fluid through said opening to inflate said body member;

stabilizing means extending over said body member when inflated to substantially prevent said body member from moving upwardly from its fully inflated position, said stabilizing means including a plurality of flexible and non-elastic and substantially non-stretchable spaced reinforcing strips of material, each affixed to a portion of the surface of said body member and held at the ground adjacent said body member, said stabilizing means substantially inhibiting further upward movement of said body member from a desired fully inflated position; and

control means co-acting with said stabilizing means to stop flow of gaseous fluid supplied by said supply means to said inflatable structure when said body member reaches said fully inflated position and to commence flow of gaseous fluid by said supply means to said inflatable structure when said body member deflates from said fully inflated position, said control means comprising (a) a flexible non-stretchable cable, (b) a switch arm and (c) a switch operably connected to said supply means, said cable fixedly attached at one end to said finite area between said reinforcing strips and fixedly attached at the other end to said switch arm, said cable having a length such that said cable moves said switch arm to the "off" position when said reinforcing strips are fully extended and such that said cable moves said switch arm towards the "on" position when said reinforcing strips are less than fully extended to closely control the flow of said gaseous fluid into said body member from said supply means, whereby movement of said body member from its fully inflated position is substantially limited.

16. The means of claim 15 wherein said stabilizing means comprises a plurality of spaced reinforced plastic strips extending over said inflatable structure when inflated, the ends of said plastic strips connected to guy wires and the other ends of said guy wires anchored to the ground adjacent said inflatable structure such that said guy wires are taut when said inflatable structure is fully inflated.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,353,309

November 21, 1967

John P. Kwake

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 9, line 13, strike out "are strips".

Signed and sealed this 3rd day of December 1968.

(SEAL)

Attest:

Edward M. Fletcher, Jr.

Attesting Officer

EDWARD J. BRENNER

Commissioner of Patents