

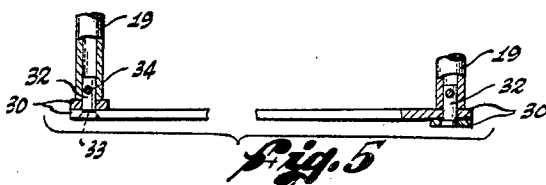
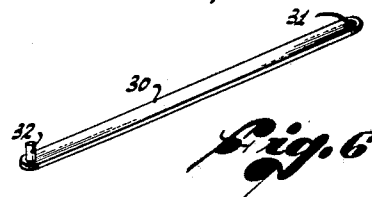
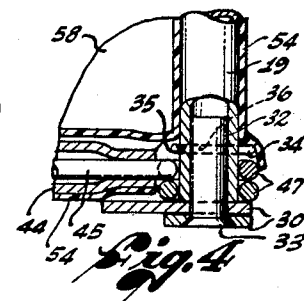
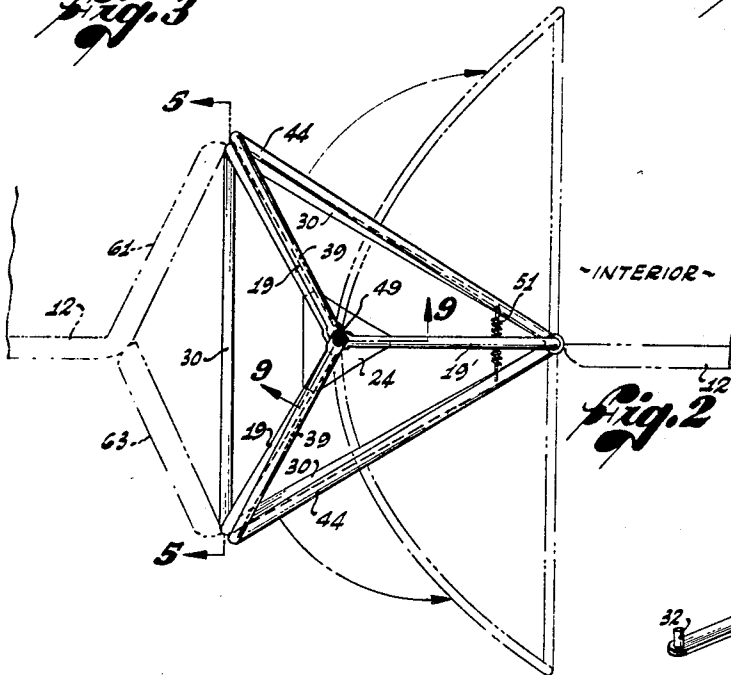
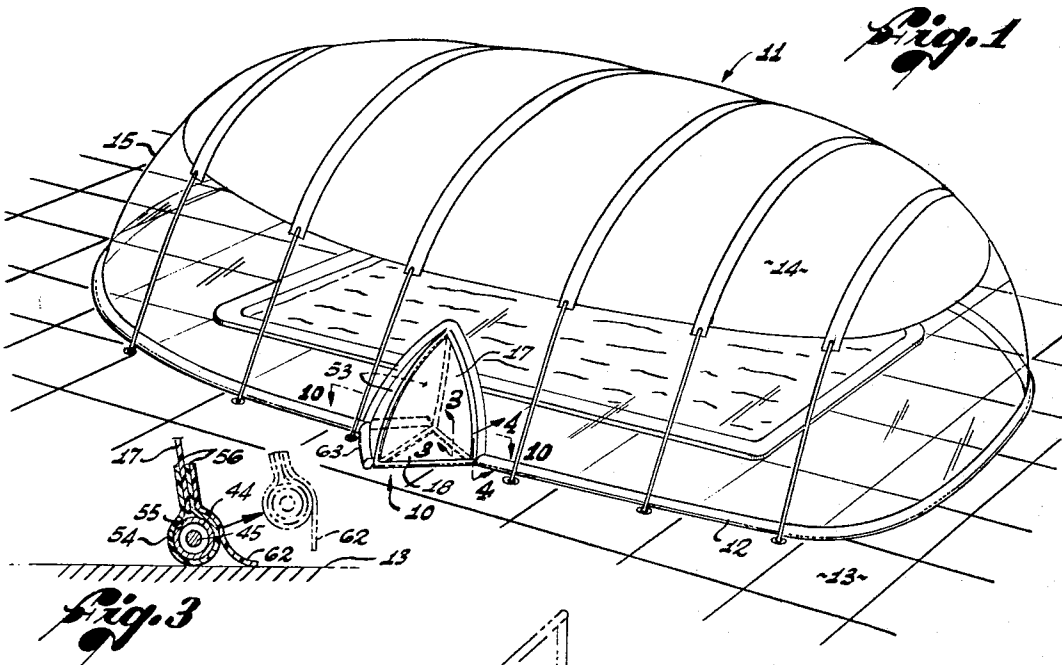
March 17, 1970

J. P. KWAKE
ENCLOSURE FOR ENTRY INTO INFLATABLE STRUCTURES
AND FOR OTHER PURPOSES

3,500,593

Filed Jan. 20, 1967

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 7

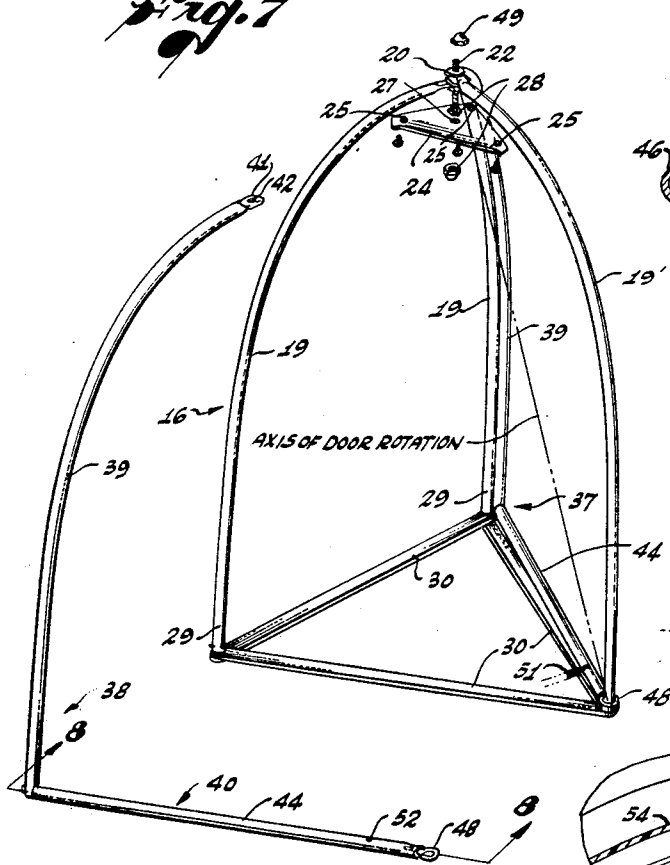


Fig. 8

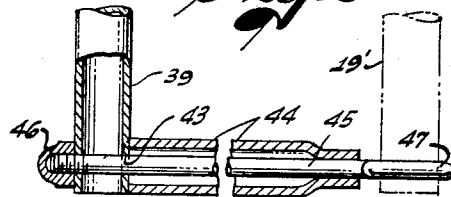


Fig. 11

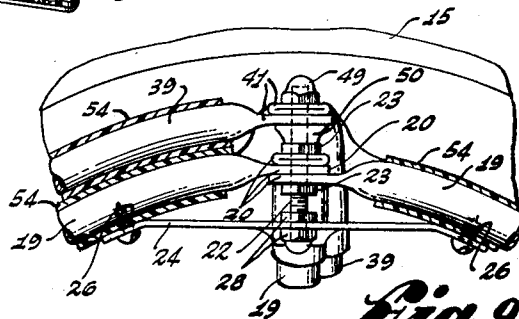
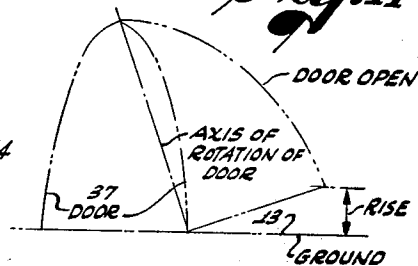
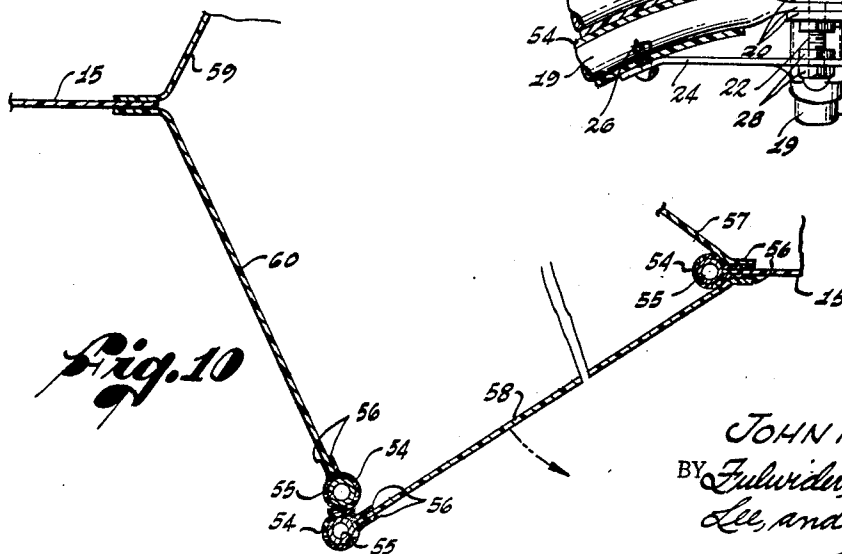


Fig. 9

Fig. 10



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ENCLOSURE FOR ENTRY INTO INFLATABLE STRUCTURES AND FOR OTHER PURPOSES

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15 Claims

ABSTRACT OF THE DISCLOSURE

An air lock entry comprising a plurality of spaced upstanding members carrying a non-porous material to thereby form a substantially leak-free enclosure and carrying thereon a pair of doors for entry into and exit from the enclosure.

BACKGROUND OF THE INVENTION

This invention relates primarily to entry enclosures for inflatable structures and, more particularly, to methods and means for entry into such structures.

Heretofore, doors employed with inflatable structures have been of several different types, one type comprises a single member door, that is, access to the inflatable structure is provided by opening a single door carried by the wall of the structure. To prevent large air losses, some doors are semi-circular in shape as, for example, the door structure described in my co-pending application entitled Closure for Inflatable Structure, Ser. No. 562,553, filed July 5, 1966 now Patent No. 3,387,412. Although such doors greatly reduce air loss from inflatable structures as compared with standard rectangular doors, entry into such structure is difficult for the elderly and physically-handicapped.

To avoid the foregoing problem, air lock enclosures resembling telephone booths have been employed in conjunction with inflatable structures. Such enclosures besides being relatively difficult to ship, assemble, and costly to manufacture, do not lend themselves for use in areas where the ground or decking slopes. Where the ground slopes, a step must be included with such enclosures to provide the required sealing engagement of the doors with the stationary walls of the enclosure. The use of a step is difficult for physically-handicapped, e.g., those in wheelchairs, to negotiate.

SUMMARY OF THE INVENTION

This invention, in general terms, comprises a readily assemblable and disassemblable air lock enclosure for use with inflatable structures. The enclosure comprises a supporting frame formed from upstanding arcuate members, the lower ends of which are set a fixed distance apart and the upper ends of which are fixedly connected to a pin. A pair of doors are hingedly mounted on one of the upstanding arcuate members of the supporting frame to sealingly engage the arcuate members of the supporting frame. The enclosure is oriented with respect to an inflatable structure so that one of the doors provide access from the enclosure into the interior of the inflatable structure and the other door provides access from the enclosure to the area external to the inflatable structure. Preferably, the doors are interconnected by a biasing means so that opening one door will act to close the other door and thereby prevent both doors from being open at the same time.

The door lock enclosure of this invention, in addition to reducing air loss from an inflatable structure as compared to a single door, extends to ground level so that the physically handicapped can easily enter the inflatable structure. Ease of entry is further facilitated by the absence of a step employed by "telephone booth" air locks

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in areas where the ground slopes. Because the doors of this invention are mounted using a hinge which is off-vertical, sealing engagement of the bottom edges of the doors with the ground is provided even though the ground slopes significantly. Air losses occurring when both doors are held open at the same time are practically eliminated by the off-vertical hinge line and by the biasing means interconnecting the doors which act to prevent both doors from being at the same time.

Assembly problems of the prior art (with attendant increased costs) are substantially reduced by my air lock enclosure construction which uses only a few basic members thereby providing for interchangeability of parts as well as simplified fabrication procedures.

The easily assemblable and disassemblable air entry enclosure can, by suitable modification, be employed as an enclosure, apart from the inflatable structure, for a variety of purposes such as a portable dressing room, tool shed, and for other storage purposes in general.

BRIEF DESCRIPTION OF THE DRAWING

FIGURE 1 is a perspective view of an inflatable structure in position over a swimming pool and including the air lock enclosure of this invention.

FIGURE 2 is a top plan view of the air lock closure of this invention and shows in dotted outline the doors in the open position.

FIGURE 3 is a partial sectional view of the upstanding member and base member of a door frame and further illustrates upward movement of the lower edge of a door as it is opened.

FIGURE 4 is a partial sectional view taken along the line 4—4 in FIGURE 1 of the hinge arcuate member of the supporting frame of the air lock closure of this invention.

FIGURE 5 is a partial sectional view taken along the line 5—5 in FIGURE 2 showing a threshold member attached to a pair of upstanding arcuate members of the supporting frame.

FIGURE 6 is a perspective view of a threshold member.

FIGURE 7 is a partially exploded perspective view of the supporting frame of the air lock enclosure of this invention.

FIGURE 8 is a partial sectional view of a base member of a door showing its method of attachment with the upstanding arcuate member of the door and with an arcuate member (shown in dotted outline) of the supporting frame.

FIGURE 9 is a sectional view taken along the line 9—9 in FIGURE 2, showing the interconnection of the upper ends of the upstanding members of the door frame and supporting frame.

FIGURE 10 is a partial sectional and partial plan view of the lower sections of the doors and end walls of the air lock enclosure and of the walls of the inflatable structure.

FIGURE 11 is a schematic view showing a door of the air closure of this invention in the closed and open positions to illustrate the increased elevation of the lower edge of the door relative to the ground when in the open position.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In general, the air lock door or closure of this invention, which is adapted to be used with inflatable structures, comprises a plurality of curved members which are positioned in a generally vertical direction to form a tripod-like structure by fixedly interconnecting the upper ends of the curved members and by positioning the other or lower ends of the curved members at fixed dis-

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tances from each other. A pair of door members, which are generally shaped to conform to the spaces between the curved members of the supporting frame, are hingedly mounted on one of the curved members of the supporting frame to open in a direction away from the interior of the supporting frame. The supporting frame and doors are covered by a suitable air-impervious material to form a completely enclosed space within the supporting frame. A biasing means is provided to interconnect the two doors so that when one door is opened the biasing means urges the other door into an improved sealing engagement with the supporting frame. When the air lock closure of this invention is used in conjunction with an inflatable structure, such that one door opens into the interior of the inflatable structure and the other door opens externally to the inflatable structure, substantially no air leakage from the structure occurs when a person enters or exits from the structure, because only one door will be open at a time.

The air lock closure of this invention will be more specifically described in connection with the figures. In FIGURE 1, the air lock closure 10 is shown in conjunction with an inflated structure 11 which is covering a swimming pool, and which is secured to a decking 13. The inflatable structure may be of any design, the particular structure of FIGURE 1 being used only by way of illustration. The inflatable structure comprises a roof portion 14 and a wall portion 15. A circumferential ballast tube 12 is bonded to the walls 15 adjacent the decking 13 to stabilize the inflatable structure 11. The entire inflatable structure 11 (including roof portion 14, wall portion 15 and air lock closure 10) is preferably made of foldable plastic material which may be any suitable non-porous thermosetting or thermoplastic material, for example, polyvinylchloride or polyvinylacetate.

The air lock closure 10 comprises a supporting frame 16 and a pair of doors 17, 18 hingedly mounted thereon. The supporting frame 16, as is more clearly shown in FIGURES 2 and 6, comprises three upstanding arcuate support members 19 which are fixedly interconnected at the upper ends thereof. Each pair of arcuate members defines a passageway into the interior of the supporting frame 16. To provide maximum supporting strength, each of the arcuate support members 19 is tubular and is formed from a steel alloy. To reduce manufacturing time and costs, and to increase ease of assembly, each of the arcuate support members 19 is identical to the other arcuate members.

Hereafter, unless otherwise stated, each of the members forming the air lock closure of this invention will be understood to be formed from a steel. However, it will also be understood that such members can be formed from other metals such as aluminum.

The arcuate support members 19 are fixedly interconnected as shown in FIGURES 7 and 9. Each of the upper ends of the support members is drawn out to form an end flange 20, through which an opening 21 is formed sufficiently large to receive a threaded pin 22. The end flanges 20 of the arcuate support members 19 are positioned intermediate the ends of the threaded pin 22 in abutting relation and are held in such position by a pair of nuts 23 advanced into contact with the end flanges from opposite ends of the threaded rod.

To give increased stability to the supporting frame, a reinforcing plate 24, which is preferably triangular in shape, is connected to each of the three arcuate support members 19 as shown in FIGURES 7 and 9. The reinforcing plate has a hole 25 adjacent each of its apices and is affixed to the arcuate support members 19 by passing, for example, a screw, through each hole 25 in the plate and through aligned openings 26 in the arcuate members 19. Stability is further improved by providing the reinforcing plate 24 with a central aperture 27 sized to receive the threaded pin 22. The plate 24 is affixed to the threaded pin 22 by a pair of nuts 28, one of which

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is located on each side of the reinforcing plate 24 in abutting position.

Lower ends 29 of the arcuate members 19 of the supporting frame 16 are positioned at fixed distances relative to each other to further improve the stability of the supporting frame and to provide passageways, having a predetermined size, which will not change in size with frequent use. This is accomplished by interconnecting the lower ends 29 of each pair of arcuate support members 19 by employing a threshold or connecting strap 30. To facilitate assembly and disassembly each of the threshold straps 30 is identical to the other straps. As shown in FIGURE 6, each threshold strap 30 is a generally flat solid bar having an opening 31 in one end and having an anchor pin 32 extending from one face of the bar at the opposite end. The anchor pin 32 may be welded to the threshold strap 30, or, for ease of assembly, it may have a flared head and be press fitted into a countersunk hole 33 in the threshold strap 30 as shown in FIGURES 4 and 5. The diameter of that portion of the anchor pin 32 extending from the threshold strap 30 is less than the internal diameter of the upstanding arcuate members 19 of the supporting frame 16. Preferably, the diameter of the anchor pin 32 is just less than the internal diameter of the arcuate members 19 to minimize radial movement of the arcuate members about the pin. To prevent the arcuate support members from slipping off the anchor pins 32 a retaining pin 34, for example a cotter pin, is inserted through aligned openings 35, 36 in the lower ends 29 of the arcuate members and in the anchor pins respectively.

The opening 31 at the other end of each threshold strap 30 has a diameter greater than the external diameter of the arcuate members 19 of the supporting frame 16. The arcuate support members 19 are positioned by passing the lower end 29 of each arcuate member through the opening 31 in one of the threshold straps 30 and by telescoping that end of an arcuate member over an anchor pin of a second threshold strap, as shown in FIGURES 4 and 5. The result is the assembly of a base for the supporting frame 16 which forms an equilateral triangle as shown in FIGURE 2.

As thus described, the supporting frame 16 has three faces which are defined by the arcuate support members 19 and which have substantially the same shape. Thus, it will be understood that any two of the faces of the supporting frame 16 could be used as the passageways permitting exit from and entry into the inflatable structure 10. That is, any of the arcuate support members 19 could be employed as the door jamb to which the doors 17, 18 are hingedly connected. To ensure optimum sealing between confronting edges of the doors 17, 18 and the arcuate members 19 of the supporting frame 16 which form the door jambs, it is preferable to hingedly attach both doors to one of the arcuate members (hereafter designated by the numeral 19' and by the term "hinge support member") and to attach that arcuate support member 19' to the wall 15 of the inflatable structure 11 so that the selected arcuate support member 19' lies in the same plane as the wall as shown in FIGURE 2. The supporting frame 16 is then aligned relative to the wall so that the threshold strap 30 opposite the hinge support member 19' is essentially perpendicular to the wall 15 as shown in FIGURE 2. In this position, the supporting frame 16 is substantially symmetrical about the plane of the wall 15 of the inflatable structure 11.

Each door 17, 18 includes a door frame 37, 38 respectively, on which is carried a suitable covering material. Both doors 17, 18 are identical in structure and in the way in which they are mounted. Therefore, only one door will be described. As shown in FIGURE 7, each door frame 38 comprises an upstanding arcuate reinforcing member 39 and a base member 40. The upstanding reinforcing member 39 is preferably tubular and is curved substantially the same as the arcuate support members 19

of the supporting frame 16. The upper end of the upstanding reinforcing member 39 of the door frame 38 is drawn out into an end flange 41 and has an aperture 42 located therein to receive the threaded pin 22. The lower end of the upstanding reinforcing member 39 has a hole 43 extending transaxially therethrough to permit connection of the upstanding member of the door frame 38 with the base member 40 of the door frame as described hereafter. The base member 40, which is preferably longer than the threshold straps 30, comprises a tube 44 and a rod 45 which passes through and extends out both ends of the tube. One end of the rod 45 is threaded and has a diameter less than the diameter of the hole 43 in the lower end of the upstanding reinforcing member 39 of the door frame 38.

Attachment of the upstanding reinforcing member 39 with the base member 40 to form the door frame 38 is accomplished by passing the threaded end of the rod 45 through the hole 43 in the lower end of the reinforcing tube and securing the rod to the upstanding reinforcing member as by a nut 46. The other end of the rod 45 within the base member 40 is adapted to slidably rotate about the hinge support member 19' of the supporting frame 16. This is preferably accomplished by forming a hook 47 in the non-threaded end of the rod 45 to form an eye 48 having a diameter larger than the diameter of the hinge support member 19' of the supporting frame 16.

Each door frame 37, 38 is mounted on the supporting frame 16 by first passing the eye 48 of the base member 40 of the door frame upwardly over the hinge support member 19' of the supporting frame before the threshold straps 30 have been positioned as previously described. When the threshold straps 30 are connected to the arcuate support members 19 of the supporting frame 16 the hooked ends 45 of the base members 40 of the door frame 37, 38 are retained in position about the arcuate members 19 of the supporting frame 16 as shown in FIGURE 4. The upper end of the door frame 37, 38 is hingedly connected to the supporting frame 16 by passing the aperture 42 in the end flange 41 over the threaded pin 22. A cap nut 49 is threaded over the upper end of the threaded pin 22 to secure the door frames 37, 38 in position and to prevent the material of the inflatable structure 11 from tearing on the threaded pin.

When the doors 37, 38 are mounted as described, the confronting edges of the upstanding members of the door frames 37, 38 and supporting frame 16 will overlap as shown in FIGURE 10 because of the greater length of the base member 40 of the door frames as compared to the length of the threshold straps 30 of the supporting frame. However, because of the proximity to each other of the upstanding members of the door frames 37, 38 and of the supporting frame 16, the upstanding members 19 of the supporting frame will tend to resist overlapping by the upstanding reinforcing members 39 of the door frame when the doors 17, 18 are closed. To provide an improved seal between the doors 17, 18 and supporting frame 16 without forcing the upstanding reinforcing members 39 of the door frames 37, 38 over the support members 19 of the supporting frame, it is preferable to position a spacer 50 on the threaded pin 22 between the upper ends of the arcuate support members 19 of the supporting frame and the upper ends of the arcuate reinforcing members of the door frames 37, 38 as shown in FIGURE 9. The spacer 50 provides a space between the confronting edges of the upstanding members of the doors 17, 18 and supporting frame 16 to permit the upstanding reinforcing members of the door to overlap the adjacent upstanding member 19 of the supporting frame as shown in FIGURE 10 without being forced into such overlapping position.

When mounted in the manner described, the doors 17, 18 close without any external force being applied. Such self-closing results from the doors 17, 18 being

mounted, in effect, on a non-vertical hinge, that is, the hinge line of the doors is actually along a line drawn between the threaded pin 22 and the lower end 29 of the support member 19'. Sealing engagement of the inner door 17 with the inner door jambs 19 will be further aided by the positive internal pressure of the inflatable structure 11 which, acting outwardly, forces the inner door into contact with the inner door jamb. For most applications of my air lock closure, this self-closing operation is satisfactory. However, for applications where there is a tendency to open both the inner and outer doors 17, 18 at the same time, it is desirable to employ a biasing means which urges one door into a fully closed position when the other door is open. Such biasing means serves to prevent both doors from being opened at the same time and thereby maintains the internal atmosphere of the inflatable structure at the desired operating pressure.

The biasing means may have various forms but for purposes of economy and ease of assembly, a spring 51 is preferred. A spring 51 having a predetermined spring tension is connected to each base member 40 of the two doors 17, 18 as by inserting the hooked ends of the spring into openings 52 adapted to receive the spring ends. The openings 52 are located in the base members at a predetermined distance from the hinge support member 19' of the supporting frame 16 so that the spring 51 will apply the desired force to the doors when one door is opened and so that the spring will not physically interfere with human passage through the air lock closure 10.

From the foregoing description of the method in which the doors 17, 18 are mounted to the supporting frame 16 it will be apparent that the axis about which the doors open is a line running from the threaded pin 22 in the attachment point of the base member 40 of the doors with the lower end of the hinged support member 19'. Therefore, as shown in FIGURE 11, the distance between the lower edge of the doors 17, 18 and the ground or decking increases as the door is opened. The distance between the bottom of the doors 17, 18 and the decking increases with increasing distance along the bottom line of the doors from the hinge support member of the supporting frame 16. The distance between the bottom unsupported corners of the doors 17, 18 and the decking may be as large as six inches or more, depending upon the length of the base members 40 of the door frames 37, 38.

The air lock frame thus described, when covered with a suitable covering material, produces the air lock closure 10 of this invention. The supporting frame 16 and the door members 17, 18 may be covered by sheets of a suitable material, for example, a vinyl plastic, by looping the ends of the sheet material around each member of the supporting frame and doors and heat sealing the ends of the sheets to the plastic sheets to form sleeves surrounding each of these members.

However, it is preferable to first form the covering material into the desired form and then to insert the individual members of the air lock closure into the covering material sections thus formed prior to assembling these members to form the air lock closure. This is done by first cutting four plastic panels to a predetermined size—two of these panels (of equal size) 57, 58 to be used for the doors 17, 18 and the remaining two panels 59, 60 to be used to cover the space between the arcuate support members 19, 19 hereafter designated as the end walls 53 of the air lock structure. Rectangular strips of reinforced plastic material are also cut to a predetermined size. Each reinforcing strip 54 is folded about its longitudinal axis to form a sleeve 55 having two outwardly extending flanges 56 (FIGURE 10). The internal diameter of the sleeves 55 is sufficiently large to receive the upstanding arcuate members of the supporting frame 16 and of the doors 17, 18 and to receive the base members 40 of the doors.

One edge of each of the plastic panels is inserted between the flanges 56 of one of the reinforcing strips 54. The flanges are then bonded, for example by heat sealing, to the edges of the particular panel. For example, as shown in FIGURE 10, the leading edge of the door panel 58 is inserted between the flanges 56 of the reinforcing strip 54 adapted to receive the upstanding reinforcing member 39 of the door frame 38.

The plastic panels are next bonded to the walls 15 of the inflatable structure 11. However, before this is done, a generally parabolic section extending upwardly from the base of the wall is removed from the inflatable structure. A section of the water ballast tube 12, equal to about one half the width of the parabolic aperture at the decking level, is removed from the location at which the doors 17, 18 are to be positioned. The then exposed ends of the ballast tube 12 are sealed. A section 61 of the ballast tube 12 then extends approximately half the distance across the base of the parabolic aperture. This section 61 is bent inwardly to serve as the lower sealing member of the inner end wall 59 of the air lock closure 10. The non-reinforced upstanding edges of the inner and outer end wall panels 59, 60 are bonded to the wall 15 of the inflatable structure 11 by inserting the edge of the wall defining the parabolic aperture about the ballast tube section 61, between the end wall panels and bonding the overlapping edges by, for example, heat sealing. Before the upstanding edges of the inner and outer door panels are bonded to the other side of the parabolic aperture, a reinforcing strip 54, is bonded thereto in the manner previously described in connection with the bonding of the other reinforcing strips. The non-reinforced sides of the inner and outer door panels are then bonded to the reinforced edge of the wall 15 in the same manner as described in connection with the bonding of the wall and end panels of the air lock closure.

The tubular reinforcing members of the door frames 37, 38 and the support member 19, 19' of the supporting frame 16 are then inserted into the appropriate sleeves 55 formed, as described, in the plastic panels. If the inflatable structure 11 is to be shipped, each of the upstanding arcuate members is loosely connected to the threaded hinge pin 22, as previously described, and the upstanding arcuate members are rotated into the plane of the wall 15 of the inflatable structure 11. When the air lock closure 10 is folded in this manner, the resulting compact package facilitates shipping and storage. When the air lock closure 10 is to be assembled, the upstanding arcuate members carried within the sleeves 55 in the plastic panels of the supporting frame 16 and doors 17, 18 are first placed in an upstanding position. The base members 40 of the door frames 37, 38 are connected to the upstanding reinforcing members 39 of the door frame and to the hinge support member 19' of the supporting frame 16. The threshold straps 30 are attached to the upstanding arcuate members 19, 19' of the supporting frame 16 and the triangular reinforcing plate 24 is attached to the upstanding members 19, 19' of the supporting frame 16.

To ensure that substantially no air escapes from the interior of the inflated structure 11 through the interior door, a reinforced sealing strip 62 is bonded to the interior side of the inner door 17 as shown in FIGURE 3, so that the lower surface of the sealing strip contacts the decking 13 when the inner door is closed. This provides a substantially leak-free seal because the internal pressure tends to force the depending end of the sealing strip 62 into sealing engagement with the decking 13. The sealing strip 62 may be an integral extension of the reinforcing strip 54 enclosing the base member 40 of the door frame 37. However, for ease of manufacture and assembly, it is preferably to employ a separate sealing strip 62. When the inner door 17 is opened, the base of the door moves upwardly from the decking 13 as previously described and as shown in FIGURE 3. There-

fore, the depending sealing strip 62 is not abraded by being scraped along the ground and will not be caught under the lower edge of the inner door when the door returns to its closed position. When the inner door 17 returns to a sealing position with the inner door jamb the sealing strip 62 will settle into sealing engagement with the decking 13.

Sealing engagement of the lower edge of the inner end panel 59 of the air lock closure 10 is provided by bonding the lower edge of the panel to the section 61 of water ballast tubing 12 which was not cut when the parabolic aperture was formed in the wall 15 of the inflatable structure 11. To sealingly engage the lower edge of the outer end panel 60 of the air lock closure 10' to the decking 13, this lower outer edge is bonded to a separate weighted tubular member 63 which may be filled with water or other ballast material. This weighted tube 63 may be formed from the section 61 of the ballast tube 12 removed when the parabolic aperture was formed in the wall 15 of the inflatable structure 11. The threshold strap 30 connecting the upstanding support members 19, 19' of the supporting frame 16 could be bent to conform to the configuration of the end wall 53 of the air lock closure 10. If this threshold member 30 is bent in this manner, it can be used to anchor and seal the lower edges of the end panels 59, 60 to the decking in place of the ballast tubes 61, 63. However, to minimize manufacturing costs and to facilitate assembly, this threshold member 30 is made identical to each of the other threshold members.

Because air loss from the air lock closure 10 to the atmosphere external to the inflatable structure 11 is of minor importance as compared to air loss from the interior of the inflatable structure to the air lock closure, no reinforced strip depending from the bottom edge of the outer door 18 need be employed. However, some improvement may be obtained by bonding a reinforced strip (not shown) along the lower edge of the outer door 18. Preferably this reinforced strip is of shorter length than the sealing strip 62 depending from the bottom of the inner door 17 to prevent the reinforced strip from being wedged between the lower edge of the outer door 18 and the decking 13 when the outer door is closed.

Operation of my air lock closure will now be described with reference to a person entering the inflatable structure 11. Opening of the outer door 18 tensions the spring means 51, thereby urging the inner door 17 into closer sealing engagement with the supporting frame 16. When the person steps into the interior of the air lock closure 10, the increased tension on the spring returns the outer door 18 to sealing engagement with the supporting frame 16. Such person then opens the inner door 17 of the air lock closure 10 which, in turn, pulls the outer door 18 into improved sealing engagement with the supporting frame 16. At the same time, some air will escape from the interior of the inflatable structure 11 into the interior of the air lock closure 10. However, because of the small volume of the air lock closure 10 in relation to the volume of the inflatable structure 11, the air within the air lock closure is brought up to a pressure equal to the pressure of the inflatable structure with loss of only a very small amount of air from the inflatable structure. This small air loss from the inflatable structure 11 to the enclosure 10 produces an essentially negligible drop in the air pressure within the inflatable structure. The air pump (not shown) which provides air to the inflatable structure 11 can quickly raise the pressure within the inflatable structure to the desired level. In some cases, the drop in the air pressure within the inflatable structure 11 will be so low that operation of the air pump will not be required. Exiting from the inflatable structure 11 is the reverse of the described entry into the inflatable structure.

In addition to having utility as an air lock when used in combination with inflatable structures, the hereinde-

scribed entry enclosure may be used in combination with any pressurized structure. Additionally, the described enclosure may be used alone, with or without modifications, because it employs a rigid, stable frame which can be easily assembled and disassembled and shipped as a compact package. For example, the enclosure of this invention could be provided with only one door for use as, for example, a portable dressing room and for storage purposes.

Modification of the described air lock enclosure for purposes other than as an entryway may be readily made. One of the doors 17, 18 including one of the door frames 37, 38 and the associated door panels 57, 58 is first removed. The resulting exposed opening in the enclosure (between support members 19-19') is then covered with a plastic panel in a manner similar to that described in connection with attachment of the end panels 59, 60 with the exception that only a single panel need be employed. The method of attaching the new wall panel across the opening between the support members 19, 19' may be as previously described in connection with attachment of the door panels 57, 58 to the reinforced sleeve 55 extending the length of the hinge support member 19' or attachment may be as described with respect to attachment of the wall panels 59, 60 to the support members 19, 19'. Additionally, the wall 53 of the enclosure which was described as preferably being enclosed by a pair of foldable panels 59, 60 is enclosed by a single panel extending between the support members 19, 19'.

The components of the supporting frame, base and door, for example, the support members 19, 19', the threshold straps 30 and the door frame 37 will be substantially as described. Where the enclosure is not to be used in combination with a pressurized structure, the ballast tubes 61, 63 need not be employed to seal the wall panels to the ground. Either no weighted members need be used or sleeves may be formed along the lower edges of the wall panels and filled with a flexible or fluid ballast material.

What is claimed is:

1. An enclosure for entry into a pressurized structure having an aperture therein to receive said enclosure, said enclosure comprising:

a base;

a frame attached to said base including a plurality of upstanding rigid support members, each of said rigid support members having a lower end attached to said base;

connecting means connected to each of the upper ends of said rigid support members to fixedly interconnect said upper ends of said rigid support members at a point above the area defined by said base, said rigid support members defining a plurality of openings therebetween;

a pair of rigid door frames pivotally connected to at least one of said rigid support members and carrying a cover thereon of substantially the same shape and size as said openings defined by said rigid support members, thereby forming a pair of doors;

wall panels having substantially the same shape and size as said openings defined by said rigid support members and attached to said rigid support members to sealingly enclose the said openings between said rigid support members not enclosed by said doors; and

means attached to said enclosure and to the edges of said pressurized structure defining said aperture to sealingly attach said enclosure to said pressurized structure.

2. The enclosure of claim 1 wherein said base is triangular and said frame includes three rigid support members extending upwardly from the apices of said triangular base.

3. The enclosure of claim 2 wherein said pair of rigid

door frames are pivotally connected to the same rigid support member.

4. The enclosure of claim 1 wherein said pair of doors comprises an inner and an outer door and wherein said enclosure comprises, in addition, a sealing means attached to and depending from the lower inner edge of the inner door for sealingly engaging said lower edge of said inner door with the ground adjacent said inner door.

5. The enclosure of claim 4 wherein said first sealing means comprises a flexible strip depending from said inner lower edge of said inner door, said flexible strip extending downwardly to sealingly engage said ground adjacent said inner door only when said inner door is in a substantially closed position.

6. The enclosure of claim 1 comprising, in addition, a biasing means interconnecting said pair of door frames for urging one of said door frames into sealing engagement with said rigid support members defining the entryway when the other of said door frames is rotated outwardly from said rigid support members.

7. The enclosure of claim 1 wherein each of said rigid door frames comprises (a) a rigid upstanding reinforcing member having substantially the same shape as said rigid support member of said frame and having an upper end pivotally connected to said connecting means above said rigid support members and having a lower end fixedly attached to one end of (b) a rigid base member, the other end of the said rigid base member pivotally attached to the lower end of said rigid support member.

8. The enclosure of claim 1 wherein said connecting means comprises a pin extending through aligned openings in the upper ends of said rigid support members and a locking means on said pin for fixedly attaining said rigid support members on said pin.

9. The enclosure of claim 1 comprising, in addition, a reinforcing plate attached to the upper ends of each of said rigid support members.

10. The enclosure of claim 7 comprising, in addition, a spacer positioned on said connecting means between said rigid support members of said frame and said rigid reinforcing members of said door frames to position said rigid reinforcing members a spaced distance above said rigid support members to cause said rigid reinforcing members to overlap said rigid support members when the doors are closed.

11. An enclosure for entry into a pressurized structure having an aperture therein to receive said enclosure, said enclosure comprising:

a triangular base;

a frame attached to said base including three rigid upstanding support members, each of said rigid support members attached to said base and extending upwardly from the apices of said base;

connecting means connected to each of the upper ends of said rigid support members to fixedly interconnect said upper ends of said rigid support members at a point above the area defined by said base, said rigid support members defining a plurality of openings therebetween;

a pair of rigid door frames pivotally connected to one of said rigid support members and carrying a cover thereon of substantially the same shape and size as said openings defined by said rigid support members to provide a pair of doors;

wall panels having substantially the same shape and size as said openings defined by said rigid support members and attached to said rigid support members to sealingly enclose the said openings between said rigid support members not enclosed by said doors; means attached to the periphery of said enclosure and to the edges of said pressurized structure defining said aperture to sealingly attach said enclosure to said pressurized structure; and

biasing means connected to each of said doors for urging one of said doors into sealing engagement

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with said rigid support members when the other of said doors is open.

12. The enclosure of claim 11 where in said pair of doors comprises an inner and an outer door and wherein said enclosure comprises, in addition, flexible sealing means attached to the lower inner edge of the inner door to sealingly engage said lower inner edge of said inner door to the ground adjacent said inner door.

13. A rigid foldable enclosure comprising:
a base;

a frame attached to said base including a plurality of upstanding rigid support members, each of said rigid support members having a lower end attached to said base and having an upper end extending inwardly of said lower end such that each of said upper ends terminates adjacent the other of said upper ends at a point above the area defined by the base;

connecting means connected to each of said upper ends of said rigid support members to fixedly interconnect said upper ends of said rigid support members at said point above the area defined by said base, said rigid support members defining a plurality of openings therebetween;

a pair of rigid door frames pivotally connected to at least one of said rigid support members and carrying a cover thereon of substantially the same shape and size as said openings defined by said rigid support members to provide a pair of doors; and

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wall panels having substantially the same shape and size as said openings defined by said rigid support members and attached to said rigid support members to sealingly enclose the said openings between said rigid support members not enclosed by said doors.

14. The rigid foldable enclosure of claim 13 and comprising, in addition, biasing means connected to each of said doors for urging one of said doors into sealing engagement with said rigid support members when the other of said doors is open.

15. The rigid foldable structure of claim 13 wherein the upper ends of said rigid door frames are pivotally connected to said connecting means above said rigid support means and the lower ends of said rigid door frames are pivotally connected to the lower ends of said rigid support members.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,500,593

Dated March 17, 1970

Inventor(s) J. P. Kwake

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below;

Column 10, line 33, "attaining" should
read "attaching".

Column 11, line 3, "where in" should
read "wherein".

SIGNED AND
SEALED
SEP 15 1970

(SEAL)

Attest:

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