

- [54] **REVERSIBLE AIR SUPPORTED STRUCTURE**
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- [73] Assignee: **Irvin Industries, Inc.**, Greenwich, Conn.
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- [51] Int. Cl. E04b 1/345
- [58] Field of Search 52/2
- [56] **References Cited**
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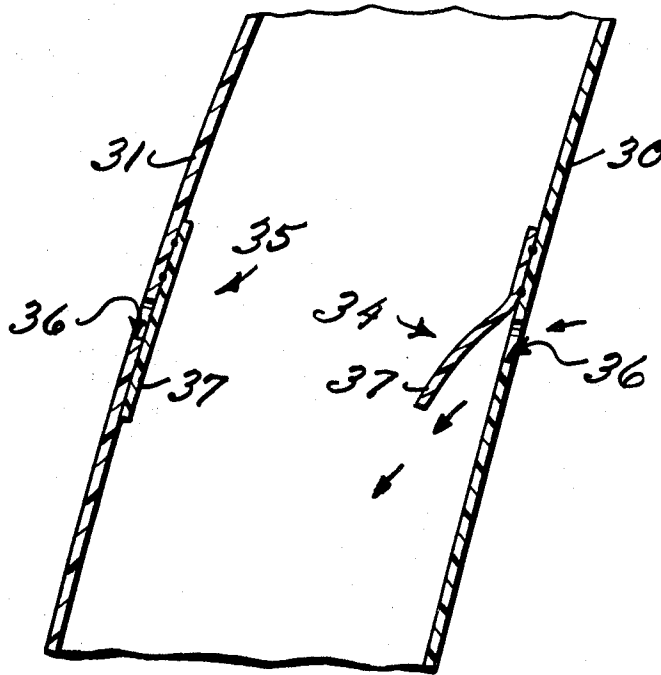
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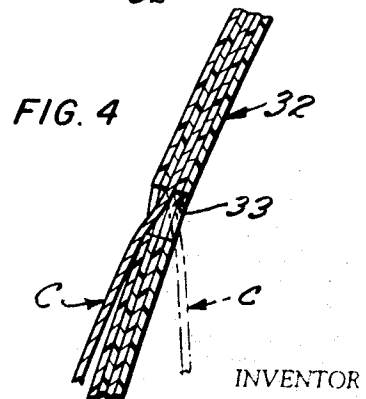
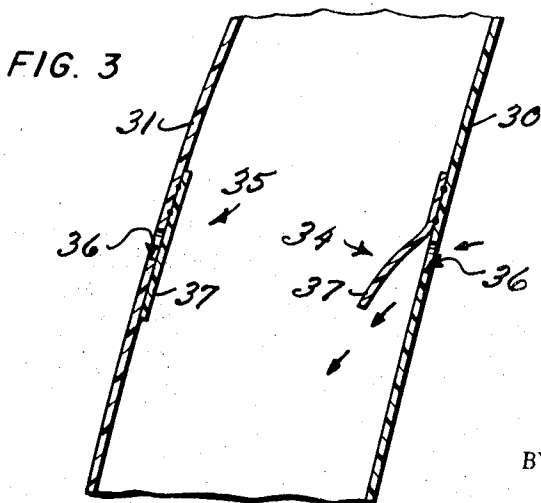
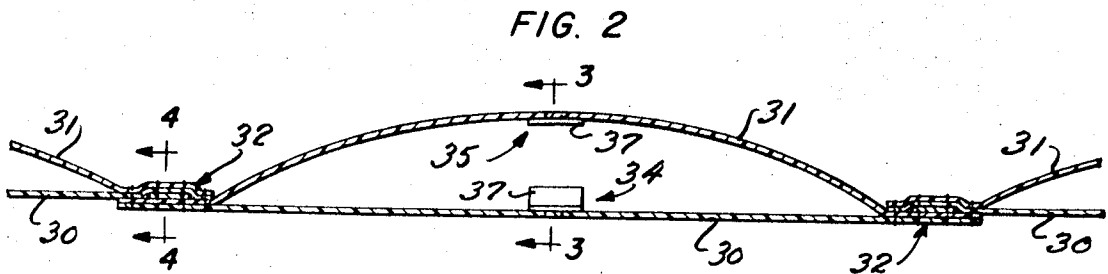
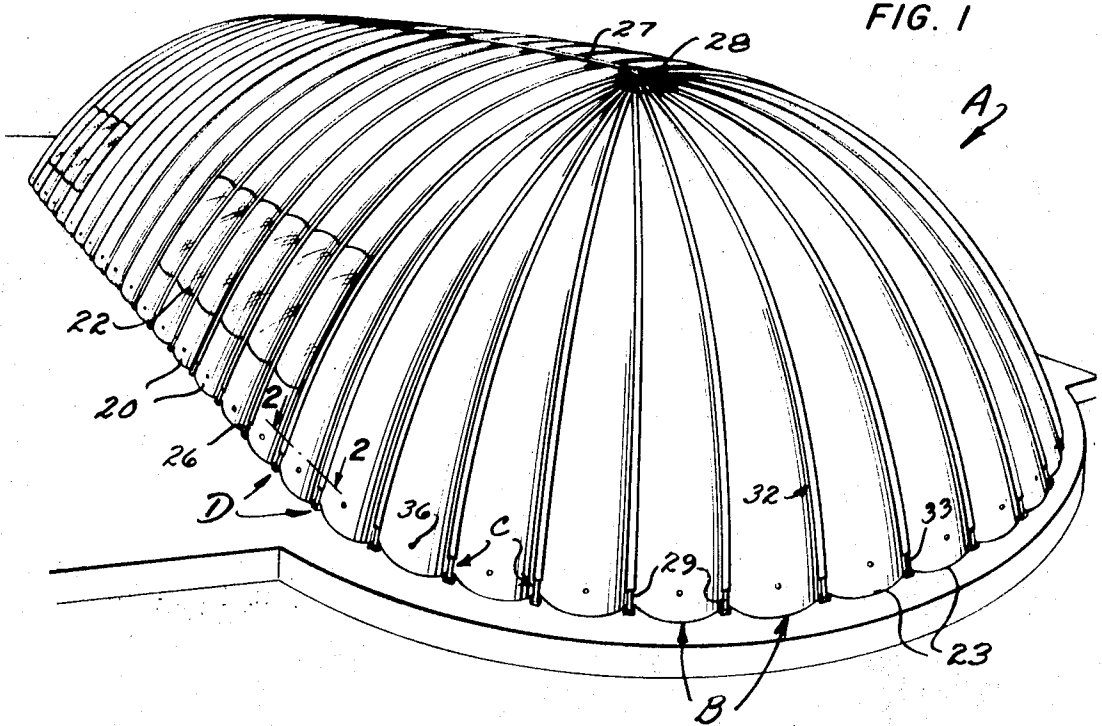
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[57] **ABSTRACT**

An air supported structure having a reversible wall portion symmetrical about a given axis.

3 Claims, 4 Drawing Figures





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REVERSIBLE AIR SUPPORTED STRUCTURE

This invention relates to improvements in air supported structures.

The outer wall portion or skin of air supported structures normally have a life expectancy of about three years. This is particularly true when vinyls are used as an outer ply, since vinyls become degraded in time by the ultra violet portion of the sun's spectrum. I have discovered that, since vinyls are almost completely opaque to these actinic rays, and if the air supported structure is provided with a two-ply skin or an inner and outer wall portion symmetrical about a given axis, that reversing the wall portions each year will substantially double the life of the air supported structure. Vinyls are used herein as an illustrative material since the same have been widely used in air supported structures and my invention is not limited to the same. The broad object of my invention is to provide a reversible air supported structure, regardless of the material of which the same is made.

Other objects and advantages of the invention will become apparent during the course of the following detailed description, taken in connection with the accompanying drawing, and in which drawing:

FIG. 1 is a perspective view of an air supported structure which may include my improved construction.

FIG. 2 is an enlarged sectional view taken substantially on the line 2—2 of FIG. 1.

FIG. 3 is an enlarged sectional view taken substantially on the line 3—3 of FIG. 2.

FIG. 4 is an enlarged sectional view taken substantially on the line 4—4 of FIG. 2.

In the drawing, wherein for the purpose of illustration is shown a preferred embodiment of the invention, and wherein similar reference characters designate corresponding parts throughout the several views, the letter A may generally designate an air supported structure which may include a plurality of panels B which may be secured in position such as by restraining webs C that may be attached to ground anchors D.

The air supported structure A as shown in FIG. 1 is merely an example of a type of air supported structure which may embody my improved construction. The air supported structure shown therein is similar to that of my co-pending design patent application Ser. No. 175,804, filed Aug. 27, 1971. It is to be specifically understood that the invention is not restricted to a round ended air supported structure as shown in FIG. 1, but that the same may be equally applicable to many other designs, for instance, such as that shown in my co-pending design patent application Ser. No. 175,803, filed Aug. 27, 1971.

As shown, some panels B may comprise side panels 20 in the nature of a cylindrical segment, some of which may be provided with a transparent window portion 22, and others may comprise end panels 23 in the nature of spherical segments.

Restraining webs C and ground anchors D may be similar to those more fully described in my co-pending application Ser. No. 173,973, filed Aug. 23, 1971. Such restraining webs C may include a plurality of webs 26 which may extend along the line of joinder of side panels 20 and an elongated centrally disposed longitudinally extending web 27 may have a loop 28 at each end thereof to which may be attached a plurality of webs 29 which may extend along the line of joinder of end pan-

els 21 at each end thereof. The lowermost end of each restraining webs 26 and 29 may be interconnected to a ground anchor D.

As shown, each panel B may include an inner ply or wall portion 30 and an outer ply or wall portion 31. Since I propose provision of a reversible structure, it is obvious that wall portion 30 is referred to as an inner wall portion merely for convenience of description, for when the structure is reversed, wall portion 30 will become the outer wall portion and wall portion 31 will become the inner wall portion.

Adjacent panels B are interconnected such as by seams 32. As shown, restraining webs C are preferably enclosed within seams 32, an opening or other suitable means 33 being provided so that restraining web C may be entrained to the appropriate side of the structure for proper interconnection in restraint of the air supported structure. For instance, in the case of restraining webs 26 which extend along the line of joinder of side panels 20, the slit or opening 33 would be provided adjacent the lowermost portion to each side of the structure; and, in the case of webs 29 which extend along the line of joinder of end panels 23, an opening or slit 33 would be provided adjacent the lower and upper portion of each end panel to respectively provide for attachment of the web to loop 28 and ground anchor D. It is contemplated that the opening or slit 33 will be substantially closed by extension of the restraining web there-through and that it will not be necessary to provide any additional closure. However, it is obvious that it is within the scope of this invention to provide any appropriate flaps or other closures which may be deemed necessary to close opening or slit 33 in order to prevent escape of an unwarranted amount of air.

My invention may be used in connection with quite a variety of types of air supported structures. In the form shown in the drawing, I have adapted my invention so that the air supported structure may also include the attributes of the insulated air supported structure as disclosed in my co-pending application Ser. No. 173,971, filed Aug. 23, 1971. As shown, wall portions 30 and 31 are respectively provided with means 34 and 35 for ingress and egress of air therebetween. In the form shown, each means 34 and 35 may comprise merely an opening 36 through which air may freely flow, a flap member 37 being provided to provide an appropriate closure over opening 36 when the wall portion is disposed as an outer wall portion. It is obvious that it is within the scope of this invention to provide some other type of valve device for permitting the ingress and egress of air between wall portions 30 and 31. Any appropriate number of means 34 and 35 may be provided. The number may be dependent upon the overall length of the panel. I have found that approximately a 2 inch opening 36, provided at each side of such as a cylindrical side section 20 covering a width of sixty feet will be sufficient.

As shown in FIG. 3, when the air structure is inflated, air will flow through opening 36 of valve means 34 of inner wall portion 30, the pressure of air therein causing flap 37 of valve means 35 to close and preventing egress of air through the valve means 35 of outer wall portion 31. The air thus received between wall portions 30 and 31 will cause outer wall portion 31 to bulge away from inner wall portion 30, providing a dead air space therebetween which will provide improved insulative characteristics to the air supported structure, as

more fully described in my aforesaid co-pending application Ser. No. 173,971. Since the air pressure on both sides of inner wall portion 30 is the same, there will be no pressure differential across the same which would cause it to bulge, and it will therefore be maintained in substantially its original plane.

When the air supported structure is reversed, so that wall portion 30 becomes the outer wall portion and wall portion 31 becomes the inner wall portion, then valve means 34 will function in a manner as previously described with respect to valve means 35, and vice versa.

Various changes in the form of the invention herein shown and described may be made without departing from the spirit of the invention or the scope of the following claims.

I claim:

1. An air supported structure having a reversible wall portion symmetrical about a given axis, said wall portion including a pair of wall members selectively reversible as inner and outer wall members, each said wall member including valve means operable to close to venting of internal air pressure when such wall member is disposed as an outer wall member and operable when such wall member is disposed as an inner wall member to permit internal air pressures to pass therethrough and into engagement with the inner surface of the outer wall member and to provide substantially equal air pressure on both the inner and outer surface of the inner wall member, each wall member having characteristic ability when serving as an outer wall member to separate from the wall member serving as an inner wall member in a bulge-like manner on application of internal air pressures to the inner surface of such wall member serving as an outer wall member to provide a sub-

stantially dead air space between the inner and outer wall members.

2. An air supported structure having a reversible wall portion symmetrical about a given axis, said wall portion including a pair of wall members selectively reversible as inner and outer wall members, said wall portion including a plurality of panels interconnected together in an edge to edge relation, at least some wall portion of at least some of said panels including a pair of wall members selectively reversible as inner and outer wall members, the side edges of said wall member being disposed with respect to each other to define an enclosed area therebetween, each said wall member including valve means operable to close to venting of internal air pressures when such wall member is disposed as an outer wall member and operable when such wall member is disposed as an inner wall member to permit internal air pressures to pass therethrough and into said enclosed area to provide substantially zero pressure differential across the wall member disposed as an inner wall member, each said wall member having characteristic ability when serving as an outer wall member to separate from the wall member serving as an inner member in a bulge-like manner on introduction of internal air pressure into said enclosed area.

3. An air supported structure as specified in claim 2 wherein the outer edge portions of said wall members are joined in adjacent seams, and strap means for securing the air supported structure in place, said seams including means for extension of said strap means to the appropriate side of said wall portion for restraint purpose in both reversible positions of said wall members.

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