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2,782,794

PNEUMATIC TENT STRUCTURE

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FIG. 1.

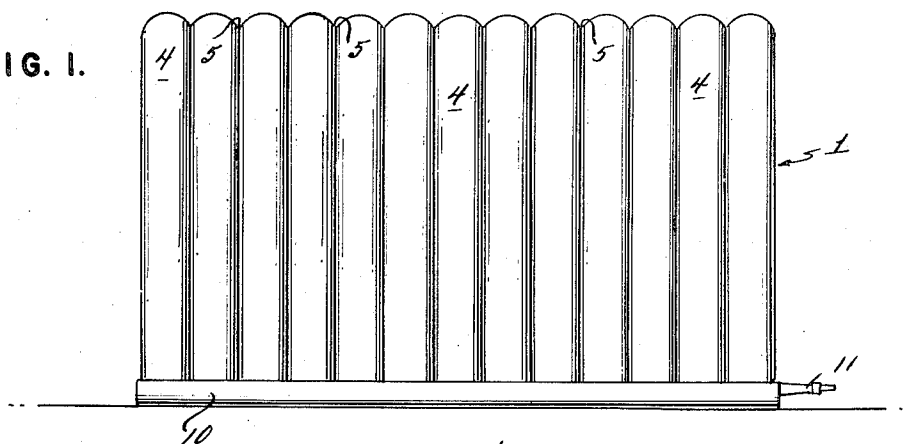


FIG. 2.

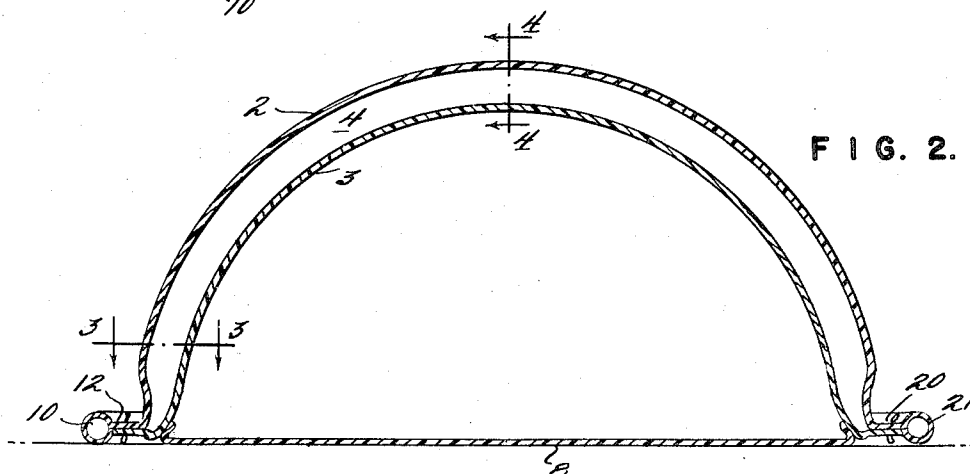


FIG. 3.

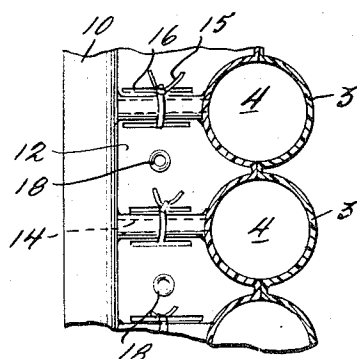
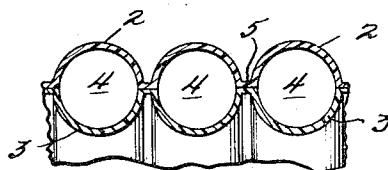


FIG. 4



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PNEUMATIC TENT STRUCTURE

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4 Claims. (Cl. 135—1)

The present invention relates to portable shelters and more particularly to pneumatic tents which are self-supporting.

A principal object of my invention is to provide a tent structure which is quickly and easily prepared for use by inflation of compartments provided therein.

A second object of my invention is the provision of a pneumatic tent structure which is self-supporting thus enabling its use in localities incapable of receiving the customary poles and stakes.

A further object of the present invention is to provide a pneumatic tent structure wherein an integrated roof and walls are formed of a plurality of joined elongated compartments inflatable to be self-supporting.

Another object of the present invention is the provision in a pneumatic tent structure of an integrated roof and walls compartmented for greater thermal insulation value.

A still further object of the invention is to provide in a pneumatic tent structure a compartmented roof and wall assembly wherein the individual compartments are separately opened to and closed against or after inflation.

A still further object of my invention is to provide in a pneumatic tent structure having a compartmented roof and wall assembly a common header in communication therewith for simultaneous inflation or deflation of all compartments and pressure equalization therein.

Other objects and advantages of the invention will be readily apparent from the following detailed description of a preferred embodiment thereof as illustrated in the accompanying drawing, wherein:

Fig. 1 is a side elevational view of a pneumatic tent structure constructed in accordance with the principles of my invention;

Fig. 2 is a vertical sectional view thereof;

Fig. 3 is a fragmentary sectional view taken substantially along the line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary sectional view taken substantially along the line 4—4 of Fig. 2.

The customary canvas tent or shelter employed by campers, hikers and sportsmen is generally cumbersome, difficult to carry and requires supporting poles or framework together with side stakes, tether ropes and the like for its erection. These structures can be set up only in special localities for in sandy soil the stakes do not hold while on rock they cannot be driven into the ground. Furthermore, a considerable clear area is needed for the ordinary tent.

Because of the complicating factors entailed in "tenting," the modern trend has been to individual sleeping bags. While light-weight and readily transportable, sleeping bags can provide protection only for a single person and camping accessories will either need separate coverings or will be left exposed.

Briefly stated, my invention contemplates the formation of a self-supporting pneumatic tent having an integrated roof and walls which are compartmented for controlled inflation and are substantially arcuate in configuration.

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Referring now to the drawing, a tent 1 formed in accordance with my inventive concept is composed of spaced laminae 2 and 3 of fluid impervious material divided into a plurality of substantially parallel elongated compartments 4. As best shown in Fig. 4, the compartments, which are substantially circular in cross-section, are created by uniting the laminae 2 and 3 at spaced intervals, as by weld seams 5 throughout the length thereof.

The opposed ends of the compartments 4 are united to a fabric section 8 which serves as the tent floor. The section 8 is of less length than the compartments 4 and secures the ends thereof against outward displacement when said compartments are pressurized in order that their desired arcuate configuration will be maintained.

A conduit 10 closed at one end and provided with an air valve 11 at the other end extends along one side of the tent 1 and is secured in spaced relation thereto through an apron strip 12 of suitable material. If it is desired, the apron strip 12 may be an extension of the material forming the primary compartments 4 of the structure joined in such manner as to be noninflatable. Feeder tubes 14 connect each of the compartments 4 to the conduit 10 to establish independent communication therewith. These channels of communication between the compartments 4 and the common supply header, the conduit 10, may be formed directly in the apron strip 12 where a heat sealable plastic film is employed in the structure, although, of course, special tubing material may be utilized if desired. Separate closure means, as for example, ties 15 are provided in each of the tubes 14 for individual control thereof. To simplify operation of the closure media, slots 16 are provided in the apron 12 in spaced parallel relation to the feeder tubes 14, and the apron sections containing the tubes may be manipulated without distortion of the remaining portions of the apron. Grommetted holes 18 are supplied, at intervals along the apron strip 12 for use in connection with anchoring stakes or pins when conditions permit and require such use. Ordinarily, however, the apron strip may be merely weighted down with sand, rocks, or dirt after the tent has been erected for adequate mooring thereof.

A complementary apron strip 20 carrying a longitudinal inflatable compartment 21 extends along the opposite side of the tent 1. The formation of the apron strip 20 is substantially the same as the apron 12 except that only a single feeder tube 14 is present therein to enable inflation of the compartment 21, from one of the compartments 4. As a precautionary measure, a closure element (not shown) is provided for this feed tube. The apron 20 serves to anchor the second side of the tent 1, the compartment 21 helping to retain the mooring loading upon the apron.

In the illustrated embodiment of my invention the compartments 4 are of equal length, thus providing an arched structure of uniform height and width. It is, however, contemplated to employ compartments of gradually decreasing length in combination with a tapering floor section whereby the arched tent becomes of progressively lesser dimensions and appears in semiconical form. It is also contemplated to provide suitable closure flaps of conventional design for the ends of the tent.

The conduit 10 provides a common airway permitting all compartments of the tent to be inflated or deflated simultaneously and serves to equalize the pressures existing therein. An air pump, or bottled compressed air may be employed to inflate the tent 1, the gas being introduced through the valve 11 in the conduit 10. Bottled carbon dioxide or nitrogen would serve equally as well as air where these gases are available. Since, while in use with the compartments pressurized, a leak in one would result in ultimate deflation of all, were inter-

communication therebetween to be maintained, such intercommunication is halted by the closing ties 15, or similar valve means provided in the feeder tubes 14 between each compartment 4 and the main conduit 10. Thereafter, a leak in one of the compartments 4 will result only in deflation of that compartment and the utility of the tent 1 per se is not impaired.

It should also be pointed out that this individual control of the separate compartments 4 permits isolation of any which have been damaged prior to inflation of the remainder of the structure, thus enabling erection and use of the tent without preliminary repair thereof.

The ties 15, preferably formed of tapes or strings secured to the apron 12 adjacent the several tubes 14 may be used to block off the main conduit 10 at intervals rather than each of the tubes 14. In such manner a plurality of the compartments 4 are treated together as integral units in closing the sections after the tent has been inflated. As has been indicated, the ties 15 may be replaced by other closure means such as clamps or valves should it be so desired.

The arched design of my pneumatic tent offers maximum structural strength in maintaining its shape against external pressure by utilization of the rebound characteristics of an inflated circular tube. Straight cylindrical compartments may be employed in the unitary roof and wall assembly but as these would be susceptible of surface corrugation when distended into arcuate shape it is preferred that these compartments be formed initially as semi-circular tubes. It is entirely possible so to form the unitary roof and wall assembly, particularly where relatively heavy, heat-sealing plastic sheeting is employed, in such fashion that it assumes directly upon inflation, the desired arcuate configuration, pressurization merely serving to rigidify the structure. However, even when the roof and walls are pre-formed in the desired arcuate shape, it is preferred to secure the opposed ends of the compartments against outward displacement through use of the floor panel.

It will at once be obvious that various modifications in the tent structure and the arrangement of the component parts thereof are possible without departing from the spirit of my invention and the scope of the following claims.

What I claim is:

1. A pneumatic tent structure comprising spaced laminae of fluid impervious material divided into a plurality of substantially parallel elongated compartments, a layer of fabric connecting the opposed ends of the compartments, said fabric layer having a length substantially less than the lengths of the compartments secured thereto and restricting the outward movement of the compartment ends, a conduit positioned along at least one side of said structure and secured in spaced relation thereto, by means of a fabric apron, individual sections of flexible tubing lying between and connecting said conduit and said compartments, and means for closing the individual tubing sections.

2. A pneumatic tent structure as defined in claim 1 in which the individual tubing sections are closed by string ties.

3. A pneumatic tent structure comprising an integrated roof and walls formed of spaced laminae of fluid impervious material divided into a plurality of substantially parallel elongated compartments, a layer of fabric constituting the tent floor connecting the opposed ends of the compartments, said fabric layer having a length substantially less than the lengths of the compartments secured thereto and restricting the outward movement of the compartment ends, a conduit positioned along at least one side of said structure and joined in spaced relation thereto by means of a fabric apron, flexible connectors interposed between said conduit and each of said compartments to establish fluid communication therebetween and means for separately closing the flexible connectors.

4. A pneumatic tent structure as defined in claim 3 in which the flexible fluid connectors are closed by string ties.

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