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(54) **INFLATABLE SHELTER**

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(57) **ABSTRACT**

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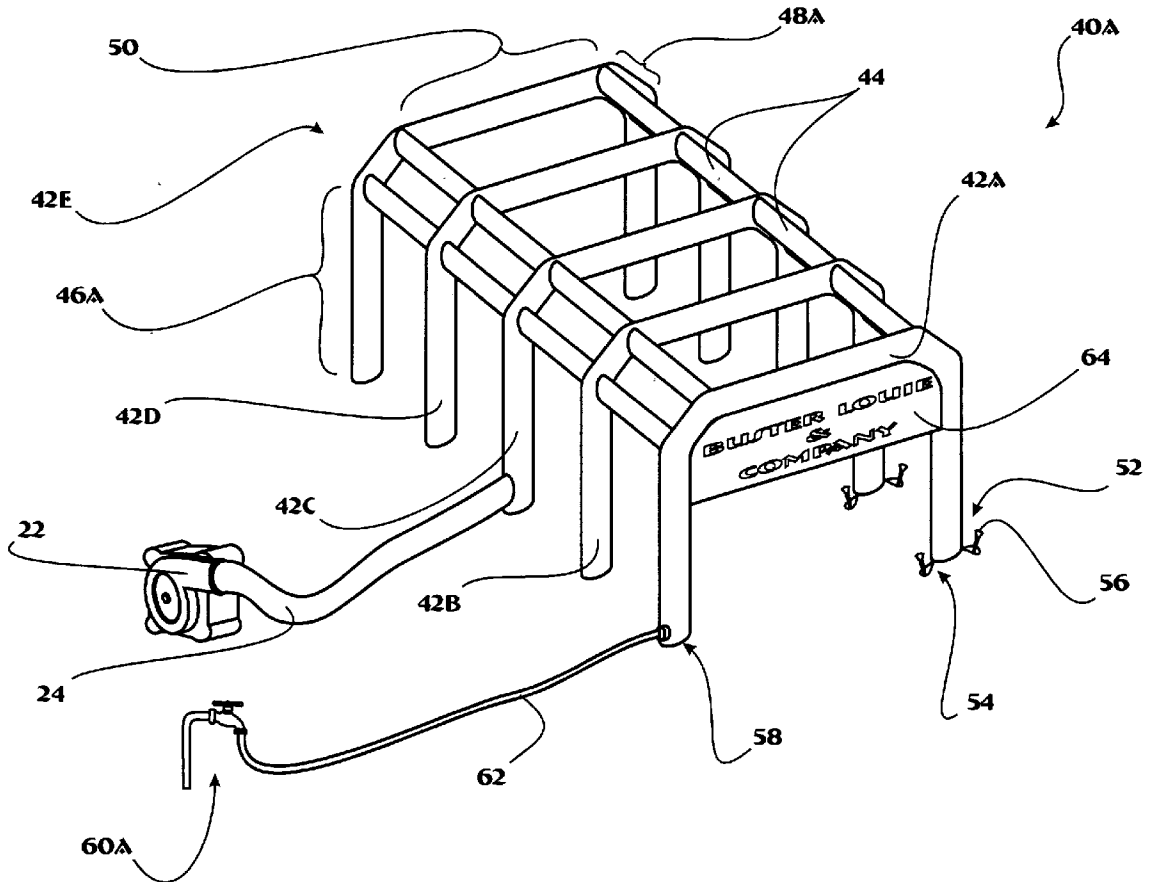
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An Inflatable Shelter is disclosed. The shelter includes a plurality of arched tubes designed to rest directly upon the ground or other surface. In order to provide cooling to occupants of the shelter, the shelter may include an attachable misting mesh for dispensing a fine mist of water or other fluid from the top of the shelter. The misting mesh may also be incorporated within the inflatable tubes of the shelter. Furthermore, the shelter may be attachable to an inflation air source as well as a liquid source for pressurizing the misting mesh. Still further, the structure may include tie-down loops extending from the feet of the arched tubes; these tubes being provided to accept stakes therethrough.



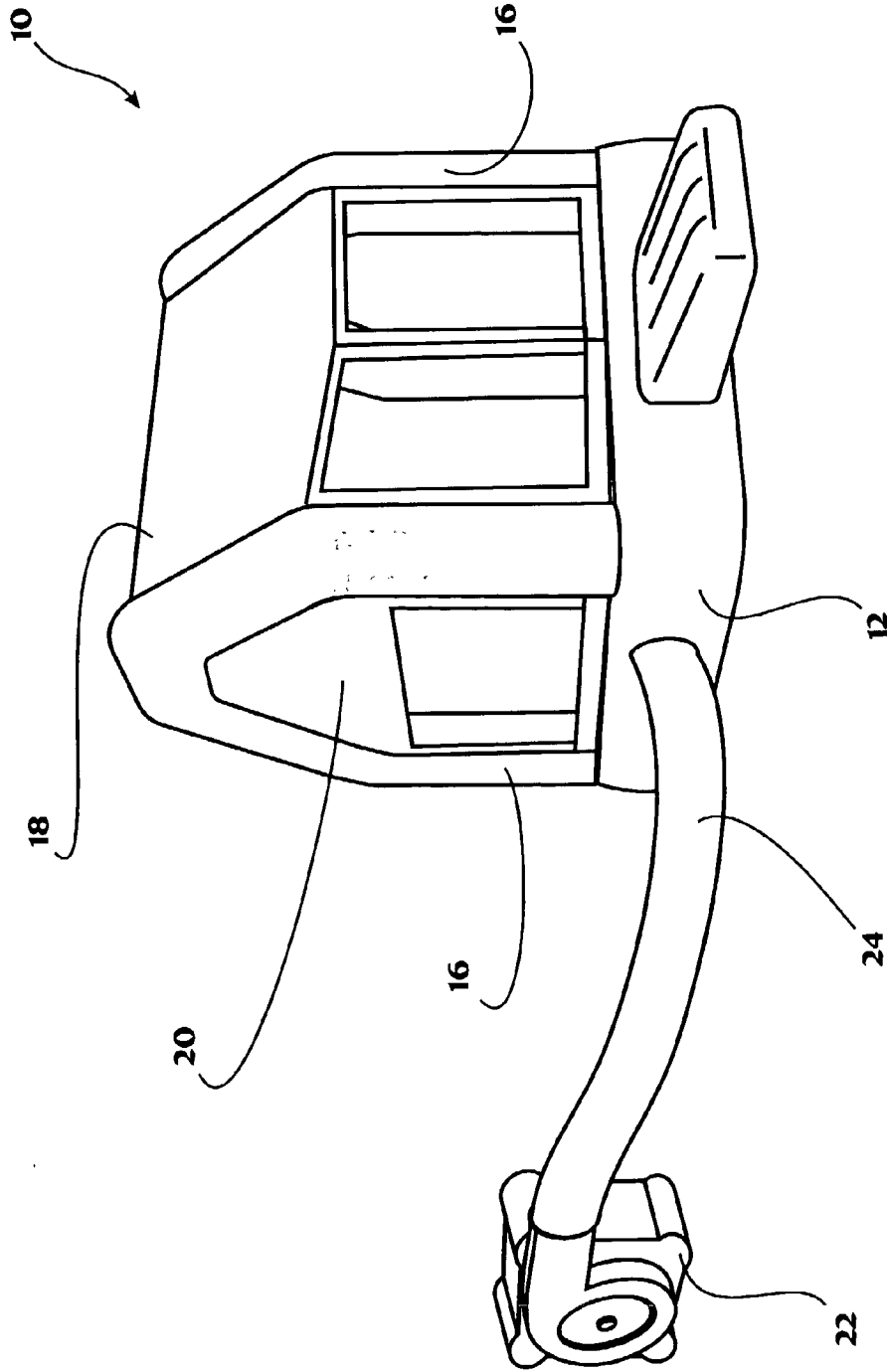


FIGURE 1
PRIOR ART

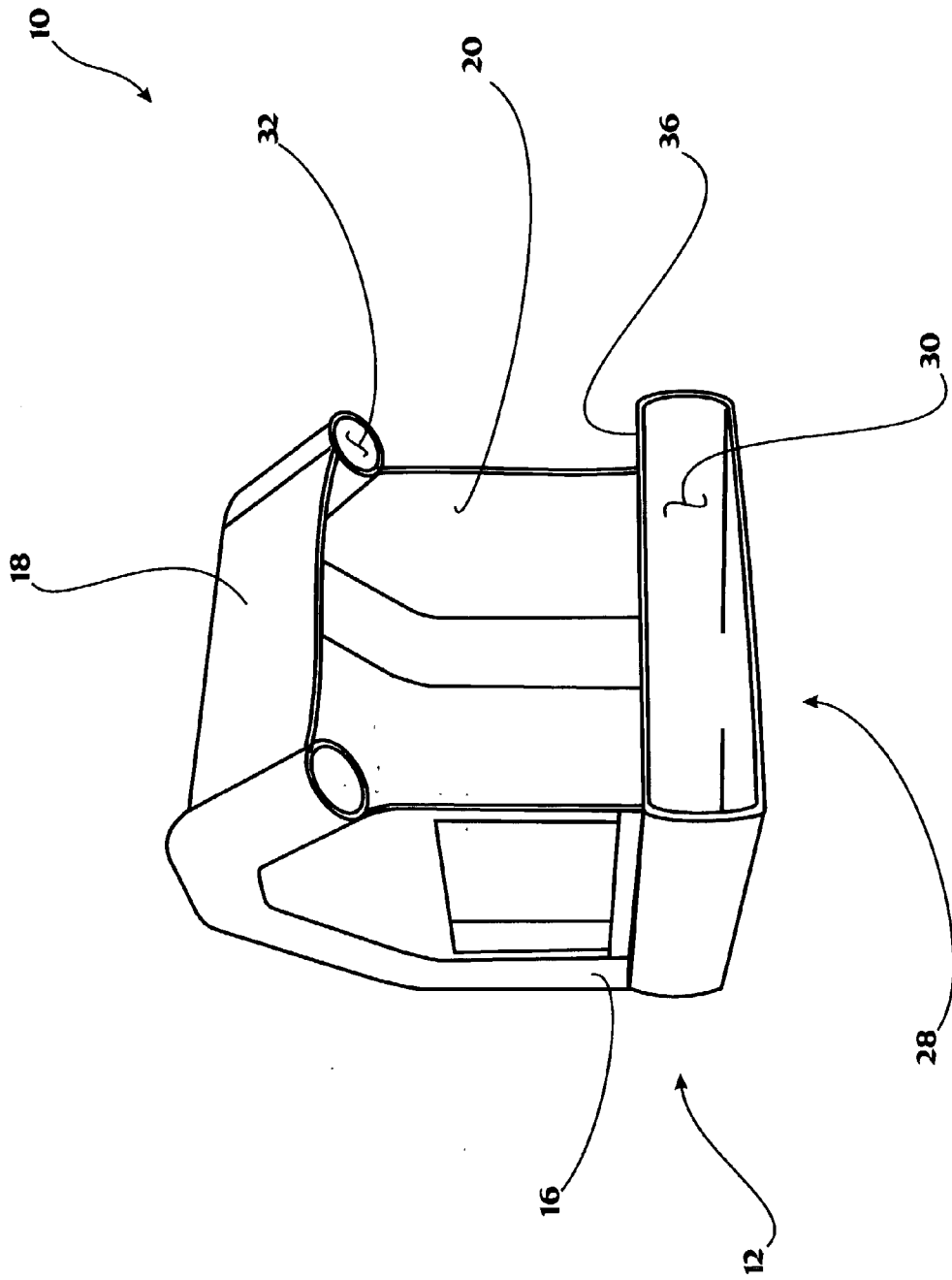


FIGURE 2
PRIOR ART

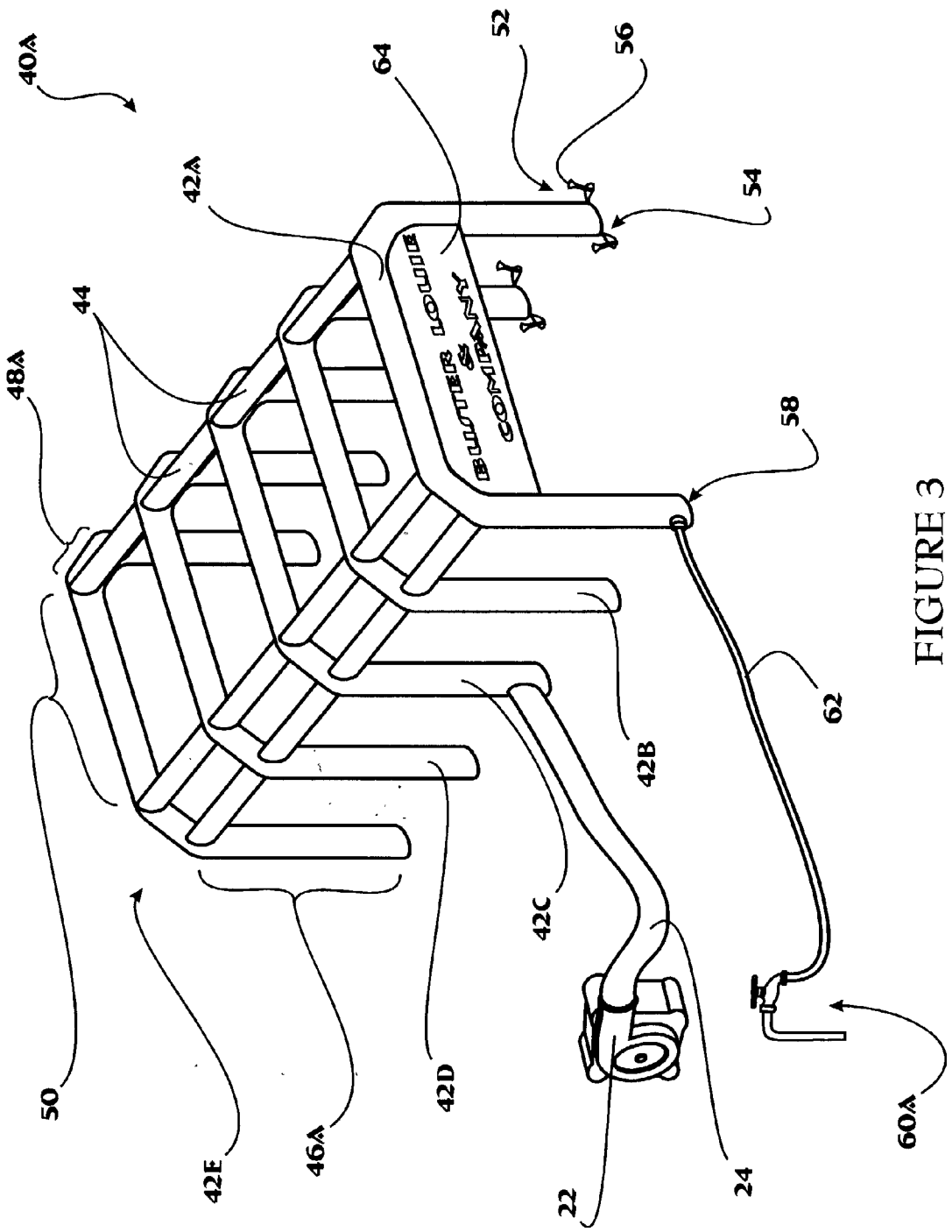


FIGURE 3

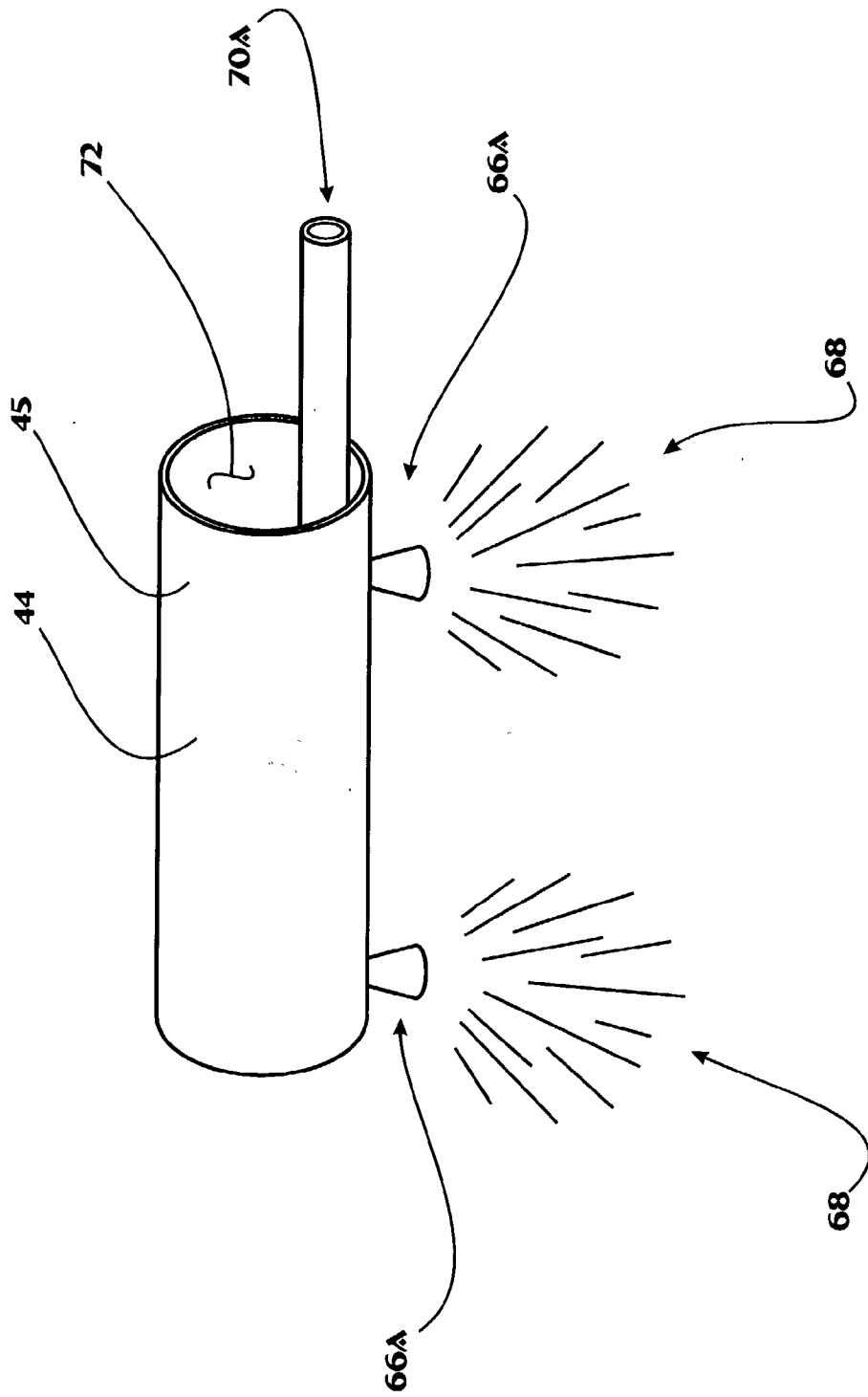


FIGURE 4

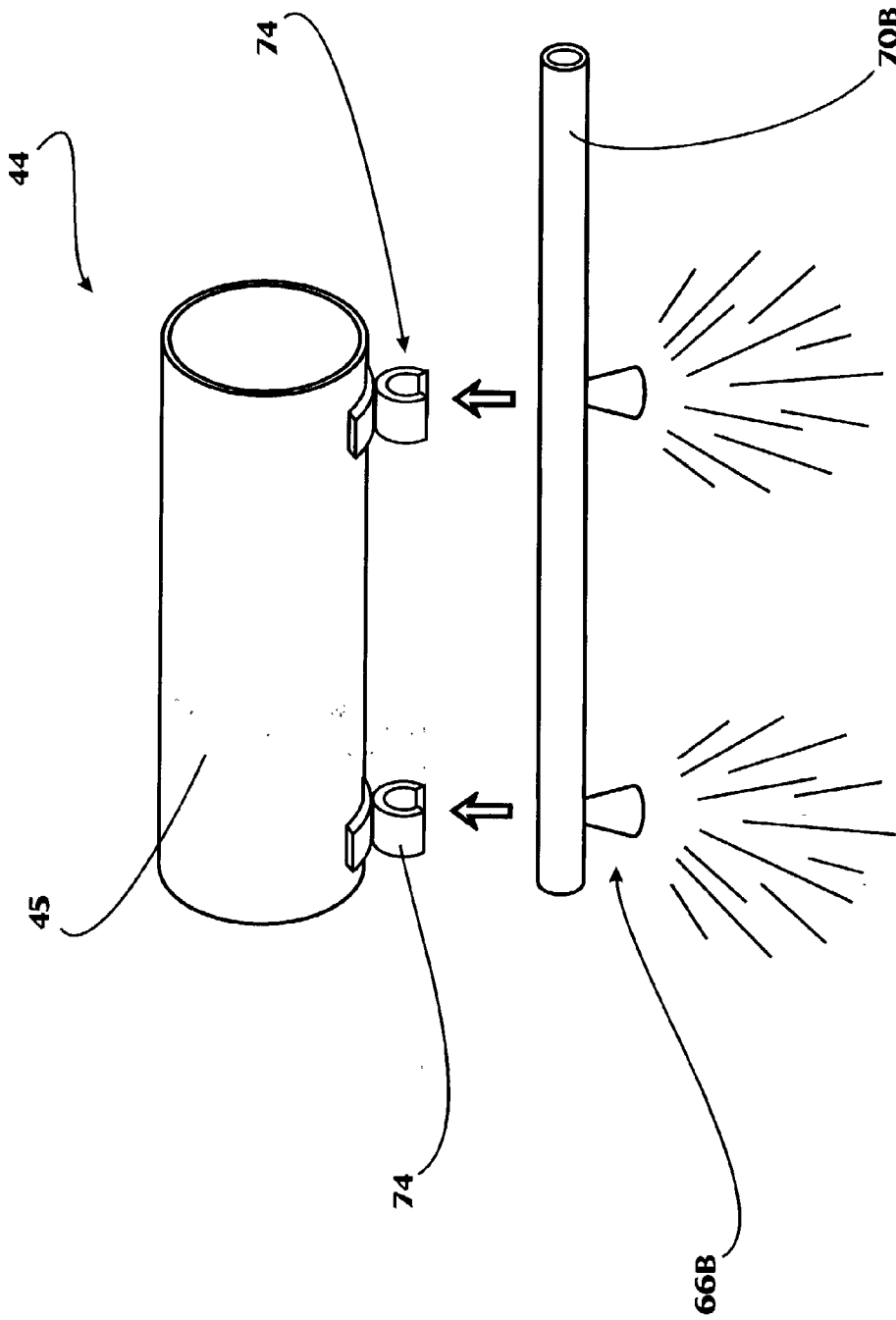


FIGURE 5

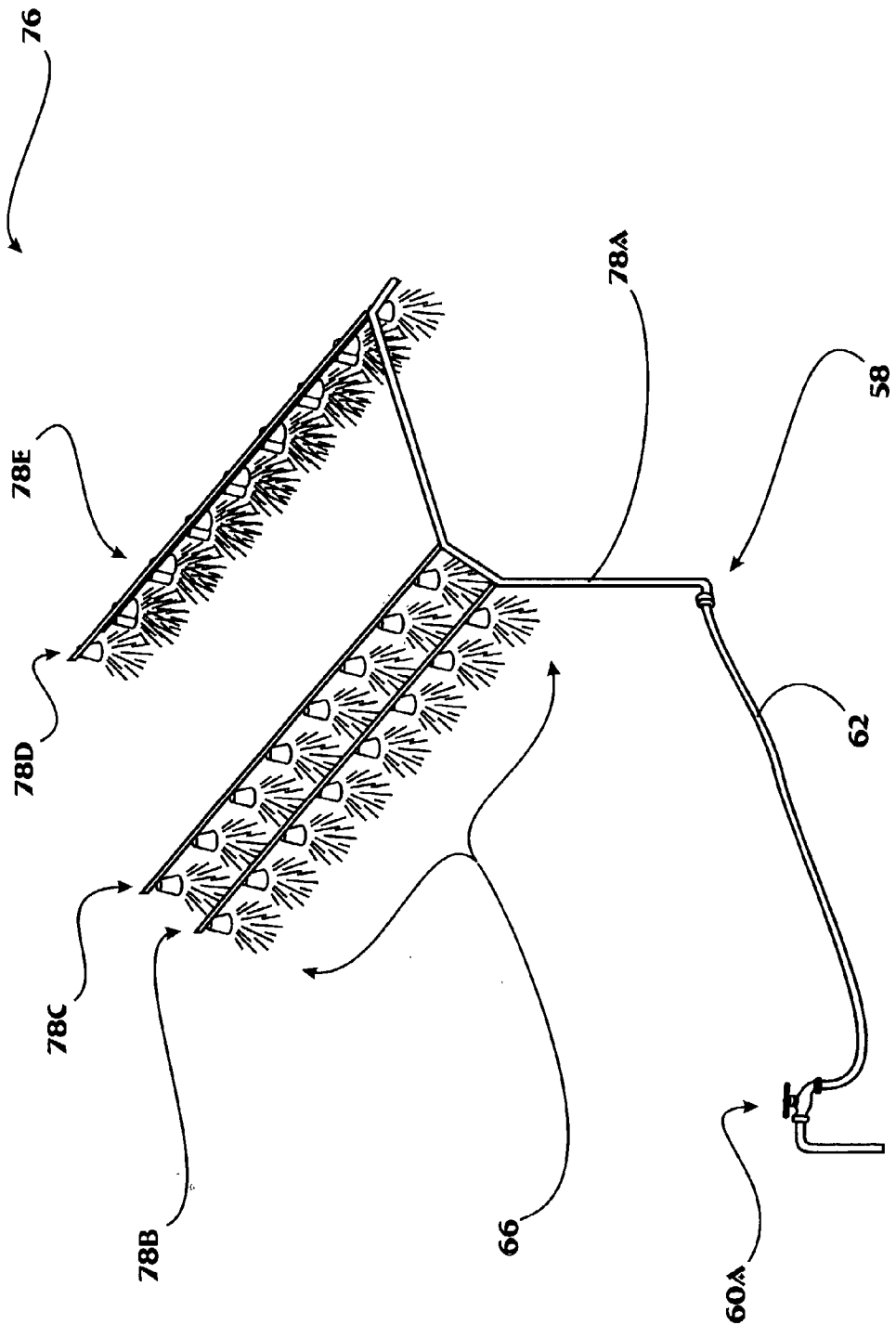


FIGURE 6

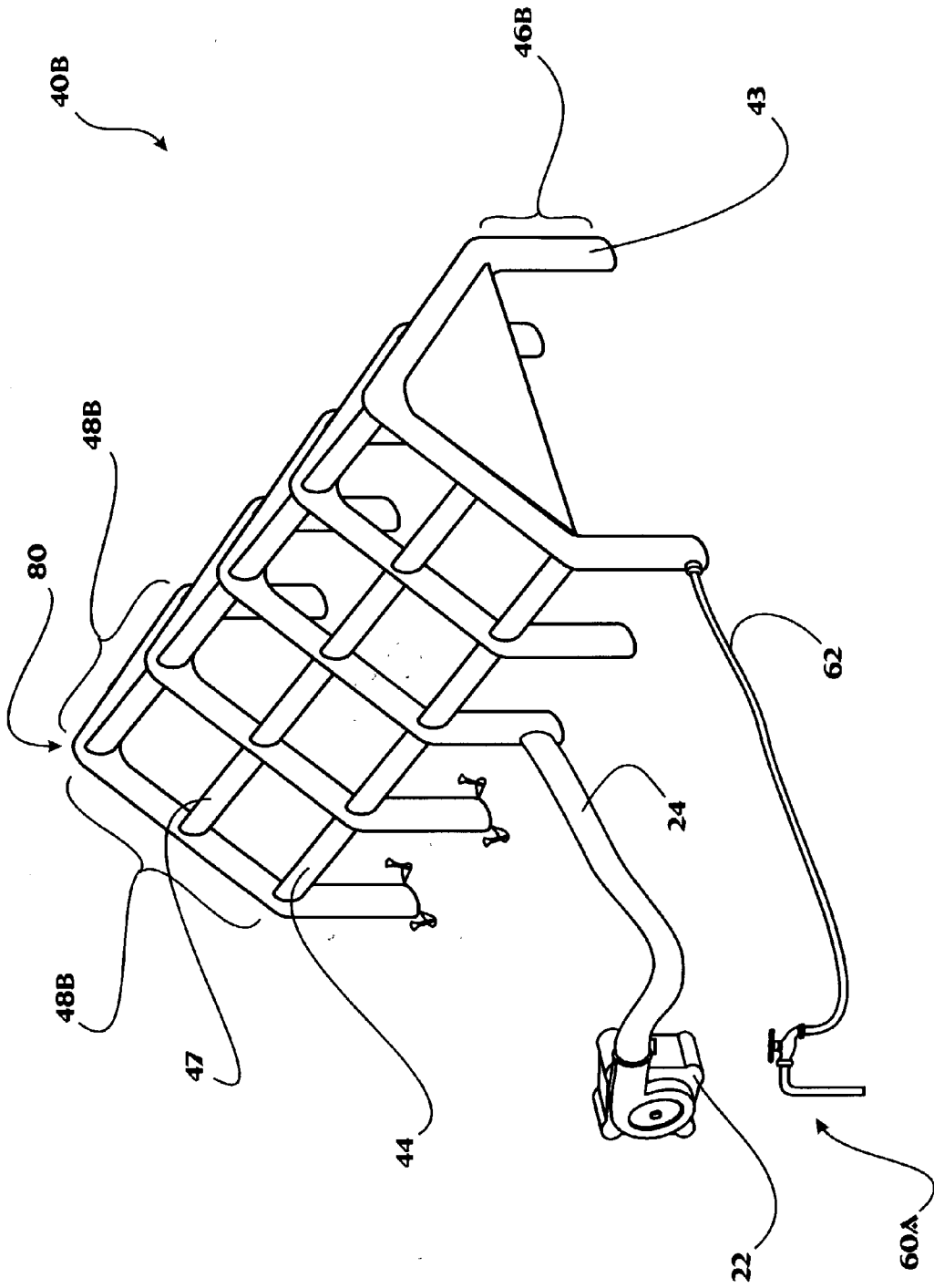


FIGURE 7

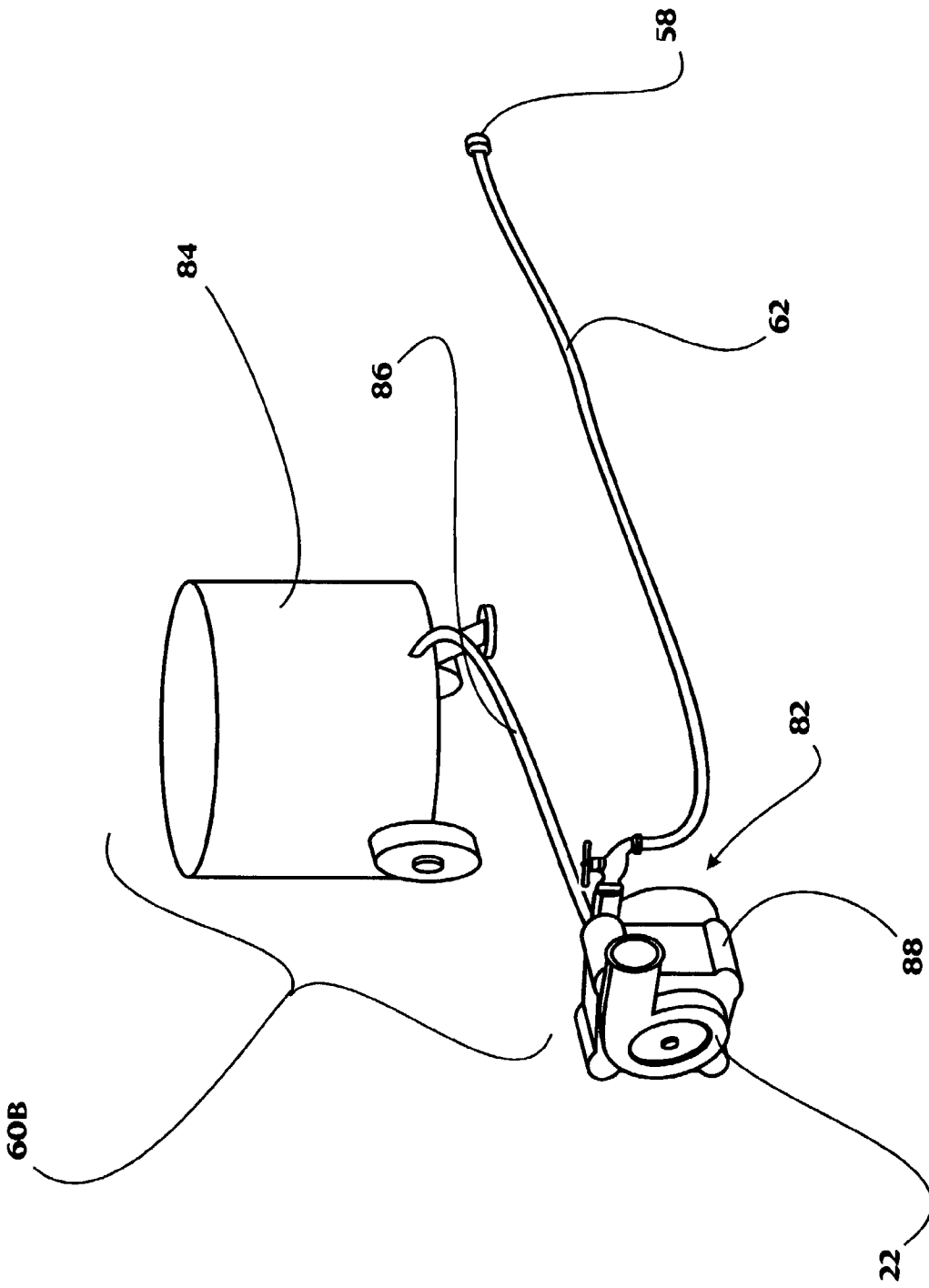


FIGURE 8

INFLATABLE SHELTER

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] This invention relates generally to utility structures and, more specifically, to an Inflatable Shelter

[0003] 2. Description of Related Art

[0004] A myriad of temporary structures are available for a variety of specialty and general purposes. Many times these structures are lightweight tent-type structures that provide protection from the sun and weather as well as providing some measure of privacy. These structures are generally collapsible in order to make them easy to transport from location to location. The problem with tent structures is that their frames are many times fairly heavy and/or difficult to handle in cases where above-average durability or stability is required. Furthermore, the frame members are generally constructed from metal (again, for durability), which can corrode over time. None of these tent-type structures provides a lightweight, durable and easily-erected protective structure.

[0005] One specialty application area for temporary outdoor structures that has exploded in recent years is that of the play toy known as the "bounce house." FIG. 1 is a perspective view of a conventional inflatable "bounce house." The conventional bounce house is a completely collapsible structure that can be erected in minutes by a single person. As shown in the FIG. 1 example, the house 10 consists of two or more inflatable frame members 16 interconnected by wall skins 20 and a roof skin 18. As is indicated by their name, the bounce house 10 has an inflatable floor pad 12 upon which children can bounce to their hearts' content without harm.

[0006] The houses 10 are generally transported to and from the locations of use in a tote bag (albeit a fairly large bag); upon arrival at the site, an electric (or gas-powered) blower 22 is first connected to the house 10 with an air fill tube 24, and then turned on. Subject to the sizing of the blower 22 and house 10, the typical inflation of the house 10 will take less than an hour. Furthermore, the transport, inflation and deflation of the house 10 can typically be accomplished by a single person. If we turn to FIG. 2, we can examine how the conventional bounce house is constructed.

[0007] FIG. 2 is a cutaway perspective view of the bounce house 10 of FIG. 1. As can be seen, the roof and wall skins 18 and 20, respectively, are stretched between the inflated frame members 16. The frame members 16 themselves are essentially long tubes made from rubber-impregnated canvas (much like an inflatable boat) and defined by a hollow frame chamber 32 into which air from the blower (see FIG. 1) is blown.

[0008] Similarly, the floor pad 12 consists of a floor chamber 30 enclosed between a floor pad bottom surface 28 (resting against the ground), and a floor pad top surface 26 (upon which the children bounce). The frame chambers 32 and floor chamber 30 are in fluid communication with one another such that when one is inflated (or deflated), the others are inflated or deflated as well. Because of the durability of the material used for the frame members 16 and

floor pad 12, the house 10 can be inflated to a fairly high pressure where exceptional structural integrity is necessary—this does not really add to the structural weight of the house 10 (at least when compared to the tent-type structures previously described).

[0009] Bounce houses 10 are constructed in a variety of shapes and sizes, including forms simulating animals, famous buildings, or even sinking cruise ships (the "Titanic"), with the intent being to provide the most entertainment for the children bouncing around inside of them. Common to all of these various shapes and sizes are the inflatable frame members 16 and inflatable floor pad 12.

[0010] While the design for the bounce house 10 is interesting, it does not really provide the utility necessary for it to serve as a utility structure for temporary utilitarian use rather than as a child's play area. What is needed is an inflatable utility structure that provides the benefits of the bounce house 10 plus additional usefulness.

SUMMARY OF THE INVENTION

[0011] In light of the aforementioned problems associated with the prior devices, it is an object of the present invention to provide an Inflatable Shelter. The shelter should include a plurality of arched tubes designed to rest directly upon the ground or other surface. In order to provide cooling to occupants of the shelter, the shelter may include an attachable misting mesh for dispensing a fine mist of water or other fluid from the top of the shelter. It is a further object that the misting mesh may also be incorporated within the inflatable tubes of the shelter. It is another object that the shelter be attachable to an inflation air source as well as a liquid source for pressurizing the misting mesh. It is a still further object that the structure include tie-down loops extending from the feet of the arched tubes; these tubes being provided to accept stakes therethrough.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012] The objects and features of the present invention, which are believed to be novel, are set forth with particularity in the appended claims. The present invention, both as to its organization and manner of operation, together with further objects and advantages, may best be understood by reference to the following description, taken in connection with the accompanying drawings, of which:

[0013] FIG. 1 is a perspective view of a conventional inflatable "bounce house;"

[0014] FIG. 2 is a cutaway perspective view of the bounce house of FIG. 1;

[0015] FIG. 3 is a perspective view of a preferred embodiment of an inflatable shelter of the present invention;

[0016] FIG. 4 is a cutaway perspective view of a preferred embodiment of a rafter tube of the shelter of FIG. 3;

[0017] FIG. 5 is a cutaway perspective view of an alternate embodiment of a rafter tube of the shelter of FIG. 3;

[0018] FIG. 6 is a perspective view of a preferred misting mesh used with the shelter of FIG. 3;

[0019] FIG. 7 is a perspective view of an alternate embodiment of the shelter of the present invention; and

[0020] FIG. 8 is a perspective view of an assembly including an alternate embodiment of a water source for use with the shelters of FIG. 3 or 7.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0021] The following description is provided to enable any person skilled in the art to make and use the invention and sets forth the best modes contemplated by the inventor of carrying out his invention. Various modifications, however, will remain readily apparent to those skilled in the art, since the generic principles of the present invention have been defined herein specifically to provide an Inflatable Shelter.

[0022] The present invention can best be understood by initial consideration of FIG. 3. FIG. 3 is a perspective view of a preferred embodiment of an inflatable shelter 40A of the present invention. Unlike the conventional bounce house described above, the shelter of the present invention eliminates the floor pad; this is for at least two reasons: (1) the floor pad provides unwanted cushioning, and (2) any floor covering (i.e. over the ground) in a utility environment will invariably become soiled, will wear out, and perhaps may be a safety hazard.

[0023] The structure 40A comprises a plurality of hollow, inflatable arched tubes 42 interconnected by hollow rafter tubes 44. The arched tubes 42 and rafter tubes 44 are in fluid communication with one another such that when one is inflated or deflated, all others are inflated or deflated as well. Of course, in larger or specialty designs, the tubes 42 and 44 may be grouped together so that they might be inflated separately (e.g. from separate blowers 22).

[0024] In this embodiment, the arched tubes 42 comprise a pair of vertical portions 46A each terminating at the ground in feet 52. At the opposite ends of the vertical portions 46A are sloped portions 48A; these then transition into a horizontal portion 50 (which interconnects the two sides).

[0025] As depicted, the vertical portions 46A each terminate in a foot 52 at their ends. In close proximity to, or actually extending from each foot 52 are tie-down loops 54 or flaps for securing the shelter 40A to the ground. The shelter 40A is preferably secured to the ground with stakes 56 or the like pounded through one or more of the tie-down loops.

[0026] Similar to the bounce house discussed previously, the shelter 40A is erected by inflating with a blower 22 forcing air through an air fill hose 24. The hose 24 may be connected to any suitable connection point provided on any of the members of the shelter 40A—here it is shown connected to the bottom of one of the vertical portions 46A of the third arched tube 42C.

[0027] In this embodiment, five arched tubes, 42A-42D, respectively, are employed, however in other embodiments either more or fewer tubes 42 may be used, depending upon the desired length of the shelter 40A.

[0028] In addition to those novel aspects previously discussed, one notable aspect of the shelter 40A is that it can be configured to dispense a water mist downwardly in order to cool off persons that are under the shelter 40A. The misting system obtains its water for misting from a water source 60A, such as the outdoor hose bib shown. Water dispensed

by the source 60A is carried to the shelter 40A by a water supply hose 62, which then connects to the shelter at a water supply port 58. Misting can be turned on or off either at the source 60A or some other internal system valve. Examples of the entire misting system will be discussed below in connection with other drawing figures.

[0029] Also shown is a display panel 64 extending across the top section of the first arched tube 42A. This panel 64 may be used to advertise or to otherwise display indicia thereon. The panel 64 is preferably made from the same flexible material as the tubes 42 and 44.

[0030] Although not depicted here, it should be understood that the shelter may be configured with rollable or removable wall or roof panels for providing privacy, environmental protection, or even insect protection (such as by screens). One embodiment may comprise a permanently-attached solid vinyl sheet covering over the top portion of the shelter 40A, and one or more vinyl sheets removably attached in between the vertical portions 46, such as by hook-and-loop fasteners. Now turning to FIG. 4, we can examine the invention in more detail.

[0031] FIG. 4 is a cutaway perspective view of a preferred embodiment of a rafter tube 44 of the shelter of FIG. 3. In this embodiment, the rafter tube 44 includes an internal water distribution hose 70A running through the rafter tube chamber 72 for distributing water from the supply system (see FIG. 3) and out to the individual misting nozzles 66A. Under normal household pressure, the misting nozzles 66A will provide a fine water mist 68 which serves to evaporatively cool the air in the general vicinity of the nozzles (i.e. inside the shelter). In this embodiment, the misting nozzles 66A protrude through the tube wall 45 from the internal water distribution hose 70A. If we turn to FIG. 5, we can review another embodiment of the nozzle arrangement.

[0032] FIG. 5 is a cutaway perspective view of an alternate embodiment of a rafter tube 44 of the shelter of FIG. 3. In this embodiment, there are one or more hose clips 74 attached to (or molded into) the outside of the tube wall 45. The hose clips 74 are configured to securely grasp the external water distribution hose 70B therein. The benefits of this externally-mounted version is that the rafter tube 44 air-tight integrity is not jeopardized by the through-penetration of the nozzles, and furthermore, there is greater flexibility and control by the user of the positioning of the misting nozzles 66B—in fact, the nozzles 66B might be re-positionable from location to location on the shelter. It should further be understood that while FIGS. 4 and 5 depict the nozzles 66 extending from the rafter tube 44, they may also be positioned in other locations (e.g. from the arched tubes). Now turning to FIG. 6, we can examine how the individual misting nozzles are interrelated.

[0033] FIG. 6 is a perspective view of a preferred misting mesh 76 used with the shelter of FIG. 3. In this embodiment, the misting mesh 76 refers to a matrix of interconnected piping or tubes 78 that distribute water from the water supply port 58 and out to the individual misting nozzles 66. As discussed above, the tubes 78 may be retained within the inflated structural tubes, or they may be attached to the outer surfaces of the structural tubes, or they may be positioned in a way that is a combination of the two. Furthermore, although not depicted here, a shutoff valve and/or pressure regulator may be included in the first branch tube 78A;

provided to control the water pressure and flow. The material used for the tubes **78** is extremely flexible and durable in order to permit the structure to be collapsed and packed into a single bag without damage to either the shelter or the mesh **76**. Similarly, the nozzles **66** are constructed in a way to prevent their cutting into any of the other portions of the shelter (i.e. from plastic with no sharp edges). Having completed the review of a first embodiment of the shelter of the present invention, we will now turn to **FIG. 7**.

[0034] **FIG. 7** is a perspective view of an alternate embodiment of the shelter **40B** of the present invention. In this embodiment **40B**, alternate arched tubes **43** are employed. These alternate arched tubes **43** comprise vertical portions **46B** and long sloped portions **48B**, with the sloped portions **48B** meeting at the peak **80** of the shelter **40B**. This design provides more headroom than the previously-described embodiment, while retaining the benefits of light weight and ease of erection and packing. Although only three rows of rafter tubes **44** are shown here, it should be understood that additional rows may be added in alternate embodiments. Another optional element in this present invention is the second row of rafter tubes **47**; these second rafter tubes **47**, if included, are essentially the same construction as those previously discussed (tubes **44**).

[0035] Similar to the previous shelter embodiment, another embodiment of the instant shelter **40B** may comprise a permanently-attached solid vinyl sheet covering over the top portion (i.e. over the sloped portions **48** and peaks **80**) of the shelter **40A**, and one or more vinyl sheets removably attached in between the vertical portions **46**, such as by hook-and-loop fasteners. Finally turning to **FIG. 8**, we can evaluate yet another alternate embodiment of a component of the present invention.

[0036] **FIG. 8** is a perspective view of an assembly including an alternate embodiment of a water source **60B** for use with the shelters of **FIG. 3** or **7**. In some remote locations, for example construction sites or remote holes on golf courses, there may not be a permanent water supply available; there may, however be electrical power available (e.g. from generators or inverters). In such cases, an alternate water source **60B** may be utilized. This alternate source includes a water pump **82** and a portable water reservoir **84** (although a lake or pond may be used, if it is clean enough). In this example, the water pump **82** and blower **22** are both being run from the same motor **88**. In other embodiments, the pump **82** and blower might be separate. Furthermore, it should be appreciated that the portable water reservoir **84** shown here is simply an theoretical example to demonstrate functional relations between the components; it is not intended to restrict the potential form of the reservoir **84** in any way.

[0037] Those skilled in the art will appreciate that various adaptations and modifications of the just-described preferred embodiment can be configured without departing from the scope and spirit, of the invention. Therefore, it is to be understood that, within the scope of the appended claims, the invention may be practiced other than as specifically described herein.

What is claimed is:

1. A structure, comprising:

- a plurality of interconnecting inflatable tubes; and
- at least one misting nozzle extending therefrom.

2. The structure of claim 1, wherein:

said structure comprises at least two inflatable arched tubes; and

said misting nozzle extends from a branch tube, said branch tube in fluid communication with a fluid source.

3. The structure of claim 2, wherein:

said fluid source comprises a suction hose interconnected with a fluid pump; and

said fluid pump in fluid communication with a supply hose, said supply hose in fluid communication with said branch tube and said misting nozzle.

4. The structure of claim 3, wherein:

said inflatable arched tubes are defined by arched tube chambers, said arched tubes are attached to one another by at least one rafter tube, each said rafter tube defining a rafter tube chamber, each said rafter tube chamber in fluid communication with at least one said attached arched tube chamber.

5. An inflatable shelter, comprising:

four arched tubes, each said arched tube defined by a substantially airtight tube wall confining an arched tube chamber;

at least three rafter tubes interconnecting said four arched tubes, each said rafter tube defined by a substantially airtight tube wall confining a rafter tube chamber, said rafter tube chambers and said arched tube chambers in fluid communication with each other; and

a misting mesh attached to said shelter, said misting mesh defined by a plurality of misting nozzles and at least one branch tube connected thereto.

6. The shelter of claim 5, wherein each said arched tube is further defined by:

a pair of opposing vertical portions terminating in feet; and

a pair of sloped portions extending from said vertical portions opposite from said feet.

7. The shelter of claim 6, wherein said misting mesh is in fluid communication with a pressurized fluid source.

8. The shelter of claim 7, further comprising tiedown loops extending from at least one of said feet.

9. The shelter of claim 8, wherein said sloped portions meet at a peak.

10. The shelter of claim 8, wherein each said arched tube is defined by a horizontal portion extending between said pair of sloped portions.

11. The shelter of claim 6, wherein said branch tubes are retained within said chambers and said misting nozzles connect to said branch tubes and protrude through said walls.

12. The shelter of claim 6, further comprising a plurality of hose clips extending from the outer surface of said walls, said branch tubes retained within said hose clips.

13. An inflatable shelter and cooling system combination, comprising:

four arched tubes, each said arched tube defined by a substantially airtight tube wall confining an arched tube chamber;

at least three rafter tubes interconnecting said four arched tubes, each said rafter tube defined by a substantially airtight tube wall confining a rafter tube chamber, said rafter tube chambers and said arched tube chambers in fluid communication with each other; and

a misting mesh attached to said shelter, said misting mesh defined by a plurality of misting nozzles and at least one branch tube connected thereto.

14. The shelter and cooling system of claim 13, wherein said misting mesh is in fluid communication with a pressurized fluid source.

15. The shelter and cooling system of claim 14, further comprising tiedown loops extending from at least one of said feet.

16. The shelter and cooling system of claim 14, wherein said branch tubes are retained within said chambers and said misting nozzles connect to said branch tubes and protrude through said walls.

17. The shelter and cooling system of claim 14, further comprising a plurality of hose clips extending from the outer surface of said walls, said branch tubes retained within said hose clips.

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