A portable, lightweight ballistic panel integrated with a shelter is capable of withstanding penetration by ammunition and fragmentation, so that the occupants of the shelter remain safe and unharmed. In one embodiment of the invention, wall segments or panels of ballistic material are provided so as to hang from an interior or exterior frame member of the shelter. In another embodiment, the present invention provides a frame independent of the shelter frame to which the panels can be secured. The panels can be provided such that they fold up into portable and manageable units.
PORTABLE BALLISTIC SHELTER SYSTEM AND DEVICE

REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. provisional patent application serial No. 60/678,309, filed May 6, 2005 and entitled “Portable Ballistic Shelter System”, the disclosure of which is incorporated herein by reference.

FIELD OF THE INVENTION

[0002] The present invention relates to shelters, and more particularly to portable shelters such as tents and soft-sided shelters, so as to provide shelters capable of withstanding various types of ammunition and fragmentation and thereby protect the occupants within.

BACKGROUND OF THE INVENTION

[0003] Temporary shelters such as tents can be provided with one or more layers of material forming the outer boundaries or walls of the structure. Such layers are generally penetrable by common ammunition and fragmentation or shrapnel. While such weaknesses are of little concern to a recreational camper, they become of grave concern to those engaged in activities within tents that are positioned in military zones and other hostile areas. Such tent or shelter deployments must necessarily be close to the hostile activities in order to provide individuals such as troops with proper medical attention, decontamination facilities, and the like; however, the standard shelter wall structure provides little to no protection to the shelter occupants.

SUMMARY OF THE INVENTION

[0004] The present invention provides a portable, lightweight ballistic panel as part of a shelter capable of withstanding penetration by ammunition and fragmentation, so that the occupants of the shelter remain safe and unharmed. In one embodiment of the invention, wall segments or panels of ballistic material are provided so as to hang from an interior or exterior frame member of the shelter. In another embodiment, the present invention provides a frame independent of the shelter frame to which the panels can be secured. The panels can be provided such that they fold up into portable and manageable units.

BRIEF DESCRIPTION OF THE DRAWINGS

[0005] FIG. 1 is a top right perspective view of a sample shelter structure in which the present invention can be deployed, with one end wall broken away.

[0006] FIG. 2 is a top right perspective view of the shelter of FIG. 1, with portions of the roof cut away to show interior features.

[0007] FIG. 3 is a right front perspective view of a series of adjoining tent structures in which the present invention can be deployed.

[0008] FIG. 4 shows a right side view of a portion of a wall structure in accordance with the present invention.

[0009] FIG. 5 shows a front view of an interior wall as outfitted in accordance with one embodiment of the present invention.

[0010] FIG. 6 shows a front view of an interior wall as outfitted in accordance with another embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0011] As shown in FIGS. 1 and 2, temporary shelters 12 such as tents can be provided with one or more layers of material forming the outer boundaries or walls 14 of the structure. In some cases, material also is provided to form a floor 16 covering the otherwise exposed ground within the tent or structure. Doors 15 and windows 17 are frequently provided as well. In some shelter systems, an outer layer or cover fabric 18 is employed along with an inner layer or liner fabric 20 to provide substantial protection from the elements as well as different physical invasive species (e.g., insects, chemical or biological weapons, etc.). These fabrics are portable and may be joined together in series to form a longer structure or can be joined together as shown at 30 in FIG. 3. Further, some shelters are provided with external or internal stabilizing frames 22 to facilitate the shelter build-out and strengthen the shelter frame.

[0012] FIG. 4 is a right side view of a portion of a wall structure in accordance with the present invention. As shown in FIG. 4, a wall 14 and window 17 are provided along with internal framework 22. A ballistic panel 25 can be suspended from the framework 22 such as by a hook member 26 secured to the framework and looped through an opening in the panel. The opening can be reinforced by a grommet 27, for example. In one embodiment of the invention, the hook members 26 can be slidably mounted to the framework so as to enable a customized fitting of the ballistic paneling. For example, if a portion of a shelter were barricaded behind a military vehicle or other large object, there may be no need for ballistic paneling for that portion, as any ammunition, fragmentation or other would-be penetrating element would need to first go through the vehicle before it reached the tent. In such examples, ballistic paneling may only be required for the remaining portion of the shelter not protected by the outside object (e.g., vehicle), in which case the hook members can be moved along the framework and positioned such that the paneling secured to the hook members appropriately covers the unprotected areas of the shelter. As further shown in FIG. 4, it will be appreciated that lighting 28 and other necessary internal objects can be positioned within the tent interior of the wall structure provided in accordance with the present invention to safely allow lighting or other functions within the tent, while not being exposed to projectiles. The hook members can optionally be clasp members, such as C-shaped metal clasps biased in the closed position and having a hinged portion which allows a user to open the otherwise closed clasp to receive a loop, grommet or eyelet, for example. In one embodiment of the invention, peg members are integrally formed with the frame or tent wall for receiving the loop, grommet or eyelet.

[0013] In one embodiment, a secondary frame separate and apart from the primary frame can be erected inside of the primary frame to provide a surface for mounting the panels on the wall members. The secondary frame can be dimensioned so as to extend to the edges of the interior of the shelter generally defined by the wall members and somewhat defined by the primary frame where applicable.

[0014] FIG. 5 shows a front view of the interior wall of a shelter as provided in accordance with one embodiment of
the present invention. As shown therein, one or more wall blankets or panels 25 are positioned and secured in place along the wall member 14 of the shelter 12 in accordance with one aspect of the present invention. Each panel can be rigid or non-rigid and can be formed using soft or hard armor material to withstand bullets, small arms fire, personnel ammunitions, fragmentation from explosions, or other known forms of penetrating and potentially lethal objects (hereinafter ‘projectiles’). In one embodiment, the panel includes an outer shell of heavy-duty nylon which can contain a ballistic insert pocket made of plies of appropriate ballistic material, woven or non-woven. The insert pocket in this embodiment can be any ultra-high molecular weight polyethylene based fiber having an appropriately high strength to weight ratio and an appropriately low specific gravity as to meet threat level standards. Spectra™ and Dyneema™ materials are employed in one embodiment, as well as aramid materials such as Kevlar™ and Twaron™, for example. The insert pocket can also be made of a para-aramid fiber in a woven or non-woven form that possesses high tensile strength, cut and flame resistance and high chemical resistance. It will be appreciated that the outer shell can be provided of various types of materials depending upon the particular deployment requirements (e.g., waterproof, fire retardant, etc.).

[0015] As shown in FIG. 5, the arrangement of panels can also accommodate entry and exit components of the existing tent or structure. Thus, for example, if there is a door 15 in a doorway or entryway provided as part of the existing shelter, the panels can be arranged such that two adjacent panels overlie one another at or around the entry way, as shown by arrow 35. In such embodiment, a person desiring to enter or leave the tent can pull back or push away one of the panels and slip through the entry way. Each panel member can have the specific dimension of approximately 88 inches by approximately 110 inches, although the precise dimensions will depend upon the shelter type and the implementation involved in the deployment. In this way, the shelter of the present invention can be utilized as if the ballistics were not in the shelter. While any windows 17 will be covered in the preferred embodiment of the invention, the windows can still be opened if necessary to allow ventilation.

[0016] As further shown in FIG. 5, wall panel 14 can be provided with attachment means such as grommets or eyelets 27 integrally formed into the panel such that the grommets can be placed over and around hooks 26 or similar items provided on a tent frame or external frame so as to depend downwardly and outwardly therefrom. The tent frame (whether as part of the existing tent or as provided separately) can be provided with a cable secured thereto for receiving the hook members. In one embodiment of the present invention, the hooks are held stationary by the cable member. In another embodiment, the hooks are slidably back and forth along a horizontal cable secured to the frame in such a way that the hooks can be easily moved to the location most accessible to the panel grommets.

[0017] Alternatively, the wall panel members can be secured to the shelter or shelter frame using attachment means such as a hook and loop connector, a zipper or a snap member, for example. In the embodiment incorporating a zipper, a first zipper edge or taper can be provided on the wall panel member and a second zipper edge or taper can be provided on the shelter wall or frame. Because of the non-rigid nature of the wall panel, once it is secured to the tent frame, it is collapsible along the provided wall of the tent or shelter, in the sense that the panel rests alongside the wall and does not extend obtrusively therefrom, as shown in FIG. 4, for example.

[0018] In one embodiment of the invention, the panel can be provided with side attachment elements for securing to a separate panel in side-by-side format such that little or no space exists between the respective sides of the panels. Such arrangement can be through attachment mechanisms similar to that described for securing a panel to a structure frame as noted above. In one embodiment of the present invention, panels are placed and secured side by side with an overlap of, for example, four to six inches. In one embodiment, adjacent panels are integrally formed as a single unit. In another embodiment, the adjacent panels are integrally formed with a permanent hinge type member or are sewn or otherwise attached so as to allow either the front faces or the back faces of the panels to be mated upon hinging to assist in ease of transport, as well as breakdown and setup of the wall structure. The overlap formation can limit the ability of a projectile penetrating the seam of the two panels.

[0019] The present invention can also accommodate corners within tents or structures. A corner element may be configured to adhere or otherwise attach to the wall panel elements so as to protect any corners that may not otherwise be sealed using the panels described above. Such a corner member may be smaller in width, but of the same length so as to provide a full length barrier to any projectile that might otherwise be capable of penetrating a corner where two adjacent panels are not sufficiently overlapping. The corner member can also be provided with attachment means such as those described above for securely mating with appropriate receiving means of the tent or structure frame. In one embodiment, the side wall non-rigid panel can be bent and attached to the end panel to create sufficient overlap and protection.

[0020] FIG. 6 shows a front view of the interior wall of a shelter as provided in accordance with another embodiment of the present invention. As shown in FIG. 6, a securing pole member 44 made of metal, plastic or other suitable material can be secured to a top portion of the panel members 25 such as by straps or other suitable means on the exterior of the panels, or by folding over a top portion of the panel member and stitching a seam substantially horizontally along the panel member so as to form an opening through which the pole member can be threaded. The pole member 44 can act as an anchoring point for securing straps, cords or other restraining-type members 41 which can be used to raise and lower the panel members up and down the wall 14. The straps 41 can be nylon or other suitable material and can be secured at one end to a top shelter frame member 23 and at the other end to the pole member 44. In one embodiment of the present invention, the straps 41 are secured at a first end by hook and loop-type fasteners (or similar fasteners as described) to the pole member 44 of a corresponding panel 25, and then positioned around an upper, substantially horizontal frame member 23 with the other end of the strap being secured to the pole member 44 or the panel member 25 itself using hook and loop-type fasteners or similar fasteners. In this way, one end of the strap members 41 can be disconnected from the pole or panel member so that the
user can pull the strap member and thereby the panel member can be moved further up or down the shelter wall. As such, the present invention allows for adjusting the height of the ballistic panel member(s) on the wall.

[0021] In the embodiment shown in FIG. 6, an overlap panel member 42 is provided in between two panel members 25 around a door opening 15, and the overlap panel member 42 is not provided with a pole member or straps secured thereto. Rather, overlap panel member can be secured to the panel members 25 by sewing, hook and loop fastener or similar fastening means. In one embodiment of the present invention, overlap panel member is sewn to a first panel member, and then connected via hook and loop fastener to a second panel member adjacent the first panel member. In this way, the hook and loop-type fastener can be easily detached while the sewn connection of the overlap panel to the first panel member restricts the detachability. Thus, the overlap panel member can possibly pivot around the sewn seam as a door would pivot, thereby allowing a user easier entry and exit through a door 15 in the structure.

[0022] The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The present embodiments are therefore to be considered in all respects as illustrative and not restrictive, the scope of the invention being indicated by the claims of the application rather than by the foregoing description, and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be embraced therein.

What is claimed and desired to be secured by Letters Patent is:

1. An integrated ballistic tent or shelter, comprising:
   a portable fabric element;
   a primary frame for supporting the portable fabric element such that said fabric element is capable of covering openings in said frame so as to define a shelter interior having outer edges;
   receiving means secured to said frame for receiving a tent or shelter wall attachment;
   at least one wall attachment of ballistic strength having attachment means secured at one or more edges thereof, capable of mating with said receiving means such that said wall attachment is thereby maintained along or near the outer edges of the shelter interior.

2. The shelter of claim 1 wherein the receiving means are secured at or near the top of the frame, and wherein the attachment means are integrally formed with the receiving means.

3. The shelter of claim 1 wherein the attachment means comprises grommets and wherein the receiving means comprises hooks.

4. The shelter of claim 1 wherein the receiving means comprises hooks provided along a cable which is secured to an upper portion of the tent frame.

5. The shelter of claim 4 wherein the hooks are slidable along the cable.

6. The shelter of claim 1 wherein the at least one wall attachment is mounted on an outside of the primary frame.

7. The shelter of claim 1 wherein the at least one wall attachment is mounted on an inside of the primary frame.

8. The shelter of claim 1 wherein the attachment means is taken from the group consisting of: hook and loop fasteners, a zipper, clips, snaps.

9. The shelter of claim 1 wherein the attachment means includes a second frame separate from the primary frame, wherein the second frame is erected inside of the primary frame.

10. The shelter of claim 1 wherein said frame includes an upper frame member, wherein the receiving means comprises at least one strap having first and second ends, said strap positioned around the upper frame member such that said first and second ends depend downwardly therefrom, and wherein said attachment means includes a pole member cooperatively engaged with the at least one wall attachment and capable of engaging with the first and second strap ends such that said wall attachment can be raised and lowered using said strap.

11. The shelter of claim 1 wherein said frame includes an upper frame member, wherein the receiving means comprises at least one strap having first and second ends, said strap secured at a first end to the upper frame member, and wherein said attachment means includes a pole member cooperatively engaged with the at least one wall attachment and capable of engaging the second strap end such that said wall attachment can be raised and lowered using said strap.

12. A wall attachment for a tent or portable shelter, comprising:
   a first and second panel, each panel having a length, a top portion, substantially parallel front and back faces, and first and second side walls;
   means for adjoining a first side wall of said first panel with a second side wall of said second panel along the length of said panels, such that said first panel front face or back face can be mates with said second panel front face or back face, respectively; and
   attachment means for attaching said first and second panels to said tent or shelter such that said panels can be manipulated up and down or sideways.

13. The wall attachment of claim 12 wherein said adjoining means includes an overlap panel member secured to each of said first and second side walls, and wherein said attachment means includes a pole member secured to the top portion of said first panel, a second pole member secured to the top portion of said second panel, at least one strap member securely connected to the first pole member and at least one strap member securely connected to the second pole member.

14. The wall attachment of claim 12 wherein the attachment means comprises hooks or slasp members provided along a cable which is secured to the tent or shelter, and wherein the hooks or clasp members are slideable along the cable.

15. The wall attachment of claim 12 wherein the first and second panels form a first row of panels having a first end and a second end, and further including a second row of panels substantially identical to said first row of panels and securing means for securing said first and second row of panels together such that the first end of said first row of panels cooperatively engages the second end of the second row of panels, thereby permitting expansion and adaptation of said wall structure to different environments.
16. A reinforcement structure for tent walls, comprising:
a frame within or integrated with said tent walls; and
a plurality of individual ballistic panels secured to said
frame such that said panels are aligned but not secured
together side by side and such that no gaps exist
between adjacent panels.
17. The structure of claim 16 wherein the frame has
receiving means and the panels each have attachment means
for mating with the receiving means such that the panels can
depend downwardly therefrom alongside said tent walls.
18. The structure of claim 16 further including corner
panel members secured to one or more of said ballistic
panels.
19. An integrated internal ballistic wall framework for an
existing tent or shelter, comprising:
a frame for fitting within an existing tent or shelter having
walls defining the edges of an interior, said frame
dimensioned to approximately align with the edges of
the interior;
receiving means secured to said frame for receiving a tent
or shelter wall attachment; and
one or more wall attachments of ballistic strength having
attachment means secured at or near one or more edges
thereof, capable of mating with said receiving means
such that said wall attachments are thereby maintained
along or near the edges of the interior.
20. The framework of claim 19 wherein the receiving
means comprises hook or clasp members, and the attach-
ment means comprises grommets integrally formed into said
panels such that the grommets can be placed over and
around the hook or clasp members and the panels can
depend downwardly therefrom.
21. A method for providing a tent or portable shelter
having ballistic strength to withstand projectiles, comprising
the steps of:
erec}{a tent or portable shelter having an external or
internal frame;
providing said frame with receiving means for receiving
one or more wall attachments; and
providing one or more wall attachments with attachment
means for connecting to said receiving means such that
said wall attachments extend downwardly from said
frame and thereby provide a barrier to projectiles.
22. The method of claim 21 wherein said attachment
means permit said one or more wall attachments to be
manipulated up and down or sideways.

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