Ballistic Vest

Background of the Invention

[0001] Some ballistic vests are constructed as a set of ballistic panels (soft armor) supported in a carrier. Many of these ballistic vests are relatively inflexible, unaccommodating to movement of the user, and thus uncomfortable. A vest that is constructed in accordance with the present invention can help to overcome those deficiencies.

Summary

[0001a] According to an aspect of the present disclosure, there is provided a ballistic vest, comprising: a carrier having a left side edge and a right side edge; a fastener for, when the vest is being worn by a user, fastening the left side edge of the carrier to the right side edge of the carrier to close the vest on the user; at least two ballistic panels supported in the carrier, including a front ballistic panel and a back ballistic panel; the carrier being made from at least two layers of material including an outer layer and an inner layer that are joined to each other at the top and bottom of the vest and that are substantially open at the left side edge and the right side edge; the carrier having portions defining a left armhole and a right armhole; the two carrier layers defining between them a panel space in the carrier; an upper part of the panel space being located above the bottom of the left and right armholes and a lower part of the panel space being located below the bottom of the left and right armholes the lower part of the panel space extending from the left side edge of the carrier to the right side edge of the carrier and being free of seams interconnecting the two carrier layers; the front panel having an upper section that is positioned in the upper part of the panel space, the carrier constraining lateral movement of the front panel upper section within the panel space; the front panel having a lower section that is positioned in the lower part of the panel space, the front panel lower section being free to move laterally in the panel space;the back panel having an upper section that is

positioned in the upper part of the panel space, the carrier constraining lateral movement of the back panel upper section within the panel space; the back panel having a lower section that is positioned in the lower part of the panel space, the back panel lower section being free to move laterally in the lower part of the panel space, the front panel lower section and the back panel lower section being movable independently of each other in the lower part of the panel space.

[0001b] According to another aspect of the present disclosure, there is provided a ballistic vest, comprising: a carrier; and a plurality of ballistic panels supported in the carrier, including a front panel for extending across the front of a user's torso when the vest is being worn by the user; the carrier having first and second lateral front sides when the vest is donned, and the carrier also having a front zipper for joining said first and second lateral front sides at the front of the vest when the vest is donned; the carrier being made from at least two layers of material including an inner layer and an outer layer which are joined to each other at their top and bottom; the carrier inner and outer layers defining between them a panel space in the carrier that is accessible through side openings between the carrier inner and outer layers; the carrier including a flap pocket extending from the outer layer panel adjacent one of the side openings; a first lateral section of the front panel being located in the panel space in the carrier on one lateral front side of the carrier, adjacent to the flap pocket; a second lateral section of the front panel being located within the flap pocket; and when the ballistic vest is donned, the flap pocket, having the second lateral section of the front panel therein, being inserted between the inner and outer carrier layers and thereby located in the panel space in the carrier on the second lateral front side of the carrier.

[0001c] According to another aspect of the present disclosure, there is provided a ballistic vest, comprising: a carrier made from at least two layers of material including an outer layer and an inner layer that are joined to each other at least partially at the top of the vest; the carrier having portions defining a left armhole and a right armhole; the two carrier layers defining between them a panel space in the carrier; at least two ballistic panels suspended in the panel space near the top of the vest, including a front ballistic panel and a back ballistic panel; the carrier having portions that substantially constrain lateral movement of the front and back panels between the armholes, and the carrier substantially enabling lateral movement of the front and back panels below the armholes independently of each other.

Brief Description of the Drawings

[0002] Features of the invention will become apparent to one of ordinary skill in the art to which the invention pertains from a reading of the following description together with the accompanying drawings, in which:

[0003] Figure 1 is a right front perspective view of a ballistic vest that is one embodiment of the invention, the vest including a carrier that is made from fabric material and that has pockets that carry ballistic panels;

[0004] Figure 2 is a front elevational view of the vest of Figure 1;

[0005] Figure 3 is a back right perspective view of the vest of Figure 1;

[0006] Figure 4 is a left side elevational view of the vest of Figure 1;

[0007] Figure 5 is a schematic illustration of an outer fabric panel that is one component of the carrier of Figure 1, as viewed from the body side;

[0008] Figure 6 is a schematic illustration similar to Figure 5, showing a front ballistic panel flap pocket added to the outer layer;

[0009] Figure 7 is a schematic illustration of the carrier of Figure 6, showing an inner fabric panel added to the outer fabric panel;

[00010] Figure 8 is a schematic illustration similar to Figure 7, showing left and right side panel pockets added to the inner layer of the carrier;

Claims

1. A ballistic vest, comprising:

a carrier having a left side edge and a right side edge;

a fastener for, when the vest is being worn by a user, fastening the left side edge of the carrier to the right side edge of the carrier to close the vest on the user;

at least two ballistic panels supported in the carrier, including a front ballistic panel and a back ballistic panel;

the carrier being made from at least two layers of material including an outer layer and an inner layer that are joined to each other at the top and bottom of the vest and that are substantially open at the left side edge and the right side edge;

the carrier having portions defining a left armhole and a right armhole;

the two carrier layers defining between them a panel space in the carrier;

an upper part of the panel space being located above the bottom of the left and right armholes and a lower part of the panel space being located below the bottom of the left and right armholes, the lower part of the panel space extending from the left side edge of the carrier to the right side edge of the carrier and being free of seams interconnecting the two carrier layers;

the front panel having an upper section that is positioned in the upper part of the panel space, the carrier constraining lateral movement of the front panel upper section within the panel space;

the front panel having a lower section that is positioned in the lower part of the panel space, the front panel lower section being free to move laterally in the panel space;

the back panel having an upper section that is positioned in the upper part of the panel space, the carrier constraining lateral movement of the back panel upper section within the panel space;

the back panel having a lower section that is positioned in the lower part of the panel space, the back panel lower section being free to move laterally in the lower part of the panel space,

the front panel lower section and the back panel lower section being movable independently of each other in the lower part of the panel space.

2. A vest as set forth in claim 1 wherein the back panel lower section and the front panel lower section at least partially overlap each other on the sides of the vest and are movable laterally relative to each other.

3. A vest as set forth in claim 2 further including left and right side ballistic panels supported on the carrier at a location below the bottom of the left and right armholes and at least partially overlapping the front and back ballistic panels, the front panel lower section and the back panel lower section being movable laterally relative to the left and right side panels.

4. A vest as set forth in claim 1 wherein the back panel lower section and the front panel lower section do not at least partially overlap each other; and

further including left and right side ballistic panels supported on the carrier at a location below the bottom of the left and right armholes and at least partially overlapping the front and back ballistic panels, the front panel lower section and the back panel lower section being movable laterally relative to the left and right side panels.

5. A vest as set forth in claim 1 wherein the carrier inner and outer layers are made from an elastic material and provide a snug fit on a user’s torso thereby to transfer load of the ballistic panels to the user’s torso while allowing the lower sections of the front and back ballistic panels to move laterally in the panel space upon movement and bending of the user.

6. A vest as set forth in claim 1 wherein the lower part of the panel space is open at both sides thereby forming a laterally extending tunnel in the carrier.

7. A vest as set forth in claim 1 wherein the two carrier layers together define a bottom opening that is configured to accept insertion of the back panel upward into the panel space, the two carrier layers having closed edge portions on either side of the

bottom opening that help to support the front and back ballistic panels in the panel space.

8. A ballistic vest as set forth in claim 1 wherein:

the carrier has first and second lateral front sides when the vest is donned, and the carrier also having a front zipper for joining said first and second lateral front sides at the front of the vest when the vest is donned;

the carrier includes a flap pocket extending from the outer layer adjacent one of the side openings;

a first lateral section of the front panel is located in the panel space in the carrier on one lateral front side of the carrier, adjacent to the flap pocket;

a second lateral section of the front panel is located within the flap pocket; and

when the ballistic vest is donned, the flap pocket, having the second lateral section of the front panel therein, is inserted between the inner and outer carrier layers and thereby located in the panel space in the carrier on the second lateral front side of the carrier.

9. A ballistic vest, comprising:

a carrier; and

a plurality of ballistic panels supported in the carrier, including a front panel for extending across the front of a user’s torso when the vest is being worn by the user;

the carrier having first and second lateral front sides when the vest is donned, and the carrier also having a front zipper for joining said first and second lateral front sides at the front of the vest when the vest is donned;

the carrier being made from at least two layers of material including an inner layer and an outer layer which are joined to each other at their top and bottom;

the carrier inner and outer layers defining between them a panel space in the carrier that is accessible through side openings between the carrier inner and outer layers;

the carrier including a flap pocket extending from the outer layer panel adjacent one of the side openings;

a first lateral section of the front panel being located in the panel space in the carrier on one lateral front side of the carrier, adjacent to the flap pocket;

a second lateral section of the front panel being located within the flap pocket; and

when the ballistic vest is donned, the flap pocket, having the second lateral section of the front panel therein, being inserted between the inner and outer carrier layers and thereby located in the panel space in the carrier on the second lateral front side of the carrier.

10. A vest as set forth in claim 9 wherein the second lateral section of the front panel has an upper edge portion that projects outward of the flap pocket to be connected with one of the carrier inner and outer layers at a location inside the carrier.

11. A vest as set forth in claim 9 wherein:

the front panel has an upper section that is positioned in an upper part of the panel space, the carrier substantially constraining lateral movement of the front panel upper section within the panel space;

the front panel having a lower section that is positioned in a lower part of the panel space, the front panel lower section being substantially free to move laterally in the panel space;

the back panel having an upper section that is positioned in the upper part of the panel space, the carrier substantially constraining lateral movement of the back panel upper section within the panel space; and

the back panel having a lower section that is positioned in the lower part of the panel space, the back panel lower section being substantially free to move laterally in the panel space.

12. A ballistic vest, comprising:

a carrier made from at least two layers of material including an outer layer and an inner layer that are joined to each other at least partially at the top of the vest;

the carrier having portions defining a left armhole and a right armhole;

the two carrier layers defining between them a panel space in the carrier;

at least two ballistic panels suspended in the panel space near the top of the vest, including a front ballistic panel and a back ballistic panel;

the carrier having portions that substantially constrain lateral movement of the front and back panels between the armholes, and the carrier substantially enabling lateral movement of the front and back panels below the armholes independently of each other.

13. A ballistic vest as set forth in claim 12 wherein:

the carrier has first and second lateral front sides when the vest is donned, and the carrier also having a front fastener for joining said first and second lateral front sides at the front of the vest when the vest is donned;

the carrier includes a flap pocket extending from the outer layer;

a first lateral section of the front panel is located in the panel space in the carrier on one lateral front side of the carrier, adjacent to the flap pocket;

a second lateral section of the front panel is located within the flap pocket; and

when the ballistic vest is donned, the flap pocket, having the second lateral section of the front panel therein, is inserted between the inner and outer carrier layers and thereby located in the panel space in the carrier on the second lateral front side of the carrier.