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(54) Title: COMBINED CARRIERS AND PROTECTIVE VESTS

(57) Abstract: Bags or carriers are provided that can be transformed into protective vests and used as body armor and ballistic shields. The carriers can be assembled in a first arrangement that enables individuals to store and transport items. The carriers can quickly and easily be converted to or deployed in a second arrangement which enables the individuals to wear the carriers as protective vests. One or more shoulder straps can be detached from the carriers for use as tourniquets, doorway securing structures, and tools for dragging injured victims.

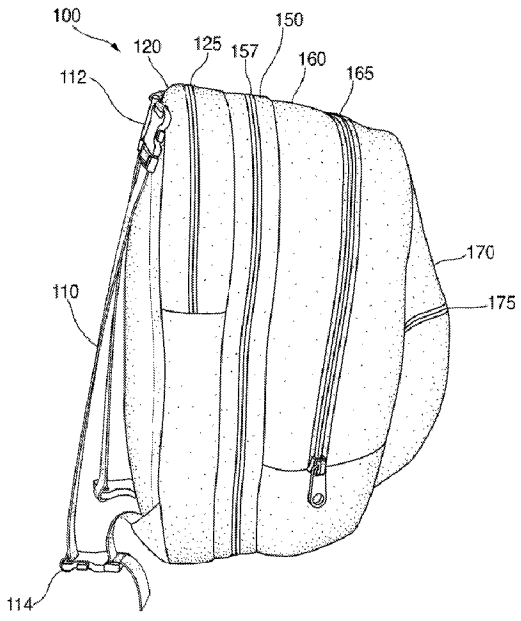


FIG. 1

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COMBINED CARRIERS AND PROTECTIVE VESTS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims benefit to U.S. Application No. 15/232,548 filed on August 9, 2016. The content of the above-identified application is herein incorporated by reference in its entirety.

FIELD OF THE INVENTION

[0002] The present disclosure is directed to accessories that can be utilized for protection and, more particularly, to bags or other carriers that can be transformed into protective vests which can be worn as body armor or ballistic shields and which are equipped with tools that provide assistance in dangerous situations.

BACKGROUND

[0003] Bulletproof vests are used to protect individuals from projectiles (e.g., such as bullets from a gun or shrapnel from an explosion), stab wounds and other forms of harm. These vests include plated or non-plated armor regions which may cover an individual's torso, back and side areas in order to protect the individual's vital organs. The vests are most commonly worn by military or police personnel prior to engaging in dangerous or potentially dangerous situations.

[0004] Because the vests are designed for military or police personnel, the vests tend to be heavy, bulky and are not easily transportable unless they are being worn. Although civilians (or other non-military or non-

police persons) have the ability to purchase such protective vests for their own safety, these individuals rarely choose to do so because it is impractical for them to carry and/or wear the protective vests on a regular basis. As a result, these individuals are typically left unprotected in the event that they are caught in an active shooter situation or other dangerous situation (e.g., such as a mass casualty incident).

[0005] In recent years, the number of active shooter situations has dramatically increased throughout the United States and other parts of the world. Many of these active shooter situations are the result of foreign and/or local terrorist activities. With the goal of inflicting as many casualties as possible, active shooters often select a "soft target" (e.g., such as a school, a stadium or airport) which is populated with unarmed and/or unprotected civilians. Civilians caught in these situations often have no way to protect themselves.

[0006] In view of the foregoing, there is a need for providing individuals with a practical means of transporting and deploying protection vests that can be used for protection in active shooter situations and other dangerous situations.

SUMMARY

[0007] The present disclosure relates to bags and other carriers that can be transformed into protective vests which can serve as body armor and/or ballistic shields, and which are equipped with additional tools that are useful in dangerous situations. The carriers can be arranged,

assembled and deployed in a first configuration which permits items to be stored and transported within the carriers when the carriers are not being used as protective vests. In the event of an active shooter situation or other dangerous situation, the carriers can be quickly and easily converted to or deployed in a second configuration that allows the carriers to be used as protective vests. The carriers include fasteners which can be disengaged to separate the carriers into front vest portions and rear vest portions. The interiors of the carriers include connectors for reassembling the front vest portions and rear vest portions to create protective vests. When the protective vests are being worn, items included within storage compartments of the carriers are able to provide additional defensive barriers against projectiles or other threats. Shoulder straps attached to the carriers can be detached. The shoulder straps may include built-in tourniquets, and/or loop assemblies that can be utilized to secure a door in a closed position or drag an injured victim to safety.

[0008] In accordance with certain embodiments, a backpack is configured to be transformed into a protective vest. The backpack includes a compartment that houses one or more connectors and a fastener that is configured to at least partially seal the compartment. Full disengagement of the fastener enables a complete separation of the backpack into at least two disconnected portions including a front vest portion and a rear vest portion. The one or more connectors enable the front vest portion to be coupled to the rear vest portion such that the backpack is reconfigured as a protective vest. At least one armor

component that is incorporated into the front vest portion or the rear vest portion.

[0009] In accordance with certain embodiments, a carrier is configured to be transformed into a vest. The carrier includes a compartment formed within two portions that are coupled together by a fastener which provides access to the compartment. At least one armor component is incorporated into one or the two portions and disengagement of the fastener enables a complete separation of the two portions from each other. One or more connectors included on interior walls of the compartment enable the two portions to be coupled together so as to form a vest.

[0010] In accordance with certain embodiments, a method is disclosed for providing a carrier that can be transformed into a protective vest. The method includes the step of providing a carrier that includes a compartment that houses one or more connectors. A fastener provides access to the compartment and disengagement of the fastener enables a complete separation of the carrier into two disconnected portions including a front vest portion and a rear vest portion. Coupling the front and rear vest portions together through the one or more connectors around an individual's body enables the carrier to be reassembled as a vest. At least one armor component is incorporated into the front vest portion or the rear vest portion.

[0011] These and other features and advantages will become apparent from the following detailed description of illustrative embodiments thereof, which is to be read in connection with the accompanying drawings.

BRIEF DESCRIPTION OF DRAWINGS

[0012] The inventive principles are illustrated in the figures of the accompanying drawings which are meant to be exemplary and not limiting, in which like references are intended to refer to like or corresponding parts, and in which:

[0013] Figure 1 is a side view of a carrier in accordance with certain embodiments of the present invention.

[0014] Figure 2 is a side view of a carrier that is arranged as a protective vest in accordance with certain embodiments of the present invention.

[0015] Figure 3 is a side view of an individual wearing a carrier that is arranged as a protective vest in accordance with certain embodiments of the present invention.

[0016] Figures 4A and 4B illustrate an interior arrangement of an exemplary carrier in accordance with certain embodiments of the present invention.

[0017] Figure 5 is a front view of an individual wearing a carrier that is arranged as a protective vest in accordance with certain embodiments of the present invention.

[0018] Figure 6 is a flow diagram of a method for transforming a carrier into a protective vest in accordance with certain embodiments of the present invention.

DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0019] The present disclosure relates to bags and other types of carriers that can be transformed into protective vests which may be used as body armor and ballistic shields. In a first configuration, the carriers are arranged to store and transport items (e.g., arranged as a backpack, bag or case that allows for transporting items). When a threat is imminent, the carriers can quickly and easily be converted to or deployed in a second configuration that serves as a protective vest which can be worn as body armor to provide protection from projectiles and other threats.

[0020] The carriers may be separated into two distinct pieces or portions: a front vest portion and a rear vest portion. When a carrier is not being utilized as a protective vest, a fastener joins or connects the front vest portion with the rear vest portion. The front vest portion and a rear vest portion may be connected using any type of fastener including, but not limited to, zippers, hook and loop connectors (e.g., Velcro®), snap connectors, buttons, quick release snaps, magnets, sleeve connectors, buckle connectors, pull cord connectors (e.g., which separate when the cord is pulled) and/or any other type of connector. In the event that an individual wishes to transform the carrier to be used as body armor, the individual can disengage the fastener to disconnect or separate the front vest portion of the bag from the rear vest portion of the bag. The front vest portion and rear vest portion can then be reassembled and connected to create a wearable protective vest. The carriers can be reassembled as protective vests using connectors located within a central compartment of the carrier.

[0021] The carriers may be equipped or integrated with one or more armor components. In certain embodiments, the carriers include a frontal armor component (e.g., which may be located in the front vest portion) which is intended to protect an individual's chest and frontal regions when the carrier is worn as a vest, as well as a rear armor component (e.g., which may be located in the rear vest portion) which is intended to protect the individual's back and posterior regions when the carrier is worn as a vest. The carriers may additionally include armor components to protect the individual's side regions or other regions of the individual's body. The armor portions may be composed of, or include, any plated or non-plated armor material. Exemplary materials that may be incorporated into the armor components may include any of the following materials either alone or in combination: metals (e.g., steel, iron, and titanium), plastics (e.g., polyethylene), high-strength fibers (e.g., Kevlar®, aramid or para-aramid fibers, and hydrocarbon fibers) and/or any other materials that can provide protection against projectiles or the like. The armor components may be permanently integrated into the carriers and/or may be removable to allow for replacement or upgrading.

[0022] The outer housing of the carriers may be constructed of any appropriate material. In certain embodiments, the housing may be constructed of any type of textile, cloth or fabric including, but not limited to, nylon, cotton, polyester, wool, leather or canvas. In certain embodiments, the housing may alternatively, or additionally, be constructed of or include rigid materials such as plastics, wood or metal

materials. In certain embodiments, the housing may alternatively, or additionally, be constructed of or include armor materials including, but not limited to, any plated or non-plated armor materials.

[0023] Some or all portions of the carriers may be water resistant. In certain embodiments, a carrier may include sections or compartments (e.g., located in or near the interior walls of a central compartment in the bag) that house metal or plated armor components and the sections or compartments may be configured to be water resistant to prevent damage to armor components in the event that the carrier is submerged or otherwise subjected to liquids. In certain embodiments, the outer housing of the carrier may additionally, or alternatively, be water resistant.

[0024] In certain embodiments, each carrier may include one or more storage compartments for holding or transporting items. The size of the compartments may vary depending upon the type of carrier. The storage compartments may be sealed or closed using any of the aforementioned fasteners or any other type of fastener. When the carrier is converted to a vest, any items included within the compartments may be retained therein in order to provide additional protection against projectiles or the like.

[0025] Each carrier may further include a compartment that houses connectors for reassembling the carrier into a protective vest. Specifically, when the front vest portion and rear vest portion of the carrier are joined with the fastener, a compartment is formed between the front vest portion and rear vest portion. A pair of shoulder straps

and a pair of mid-section connectors are stored within the compartment. The shoulder straps and mid-section connectors may be attached to and integrated with the interior walls of the compartment (e.g., on surfaces of the front vest portion and/or rear vest portion). The shoulder straps and mid-section connectors are exposed or made accessible after the carrier is separated. The separated portions can then be assembled into a protective vest by connecting the front vest portion and rear vest portion with the shoulder straps and mid-section connectors. The shoulder straps and mid-section connectors can be adjusted to accommodate the height and weight of the individual wearing the vest.

[0026] In addition to the shoulder straps that are included within the compartment to enable assembly of the protective vest, the exterior of a carrier may include one or more straps that assist an individual with transporting the carrier when it is not being utilized as a protective vest. For instance, a backpack carrier may include a pair of shoulder straps to enable an individual to carry the backpack on his or her back. Likewise, a handbag carrier (e.g., a satchel or purse) may include a shoulder strap(s) that enables the individual to rest the handbag atop his or her shoulder.

[0027] In certain embodiments, one or more of these exterior straps may be detached from the carrier and may include a built-in tourniquet and/or built-in loop assembly. In the event of an active shooter or other dangerous situation, a strap having the built-in tourniquet may be detached from the carrier to assist injured persons. Likewise, a strap

having a built-in loop assembly may be detached from the carrier and utilized to secure a door handle in order to prevent entry through a doorway, or as a tether that can assist an individual with dragging injured victims.

[0028] Each of the carriers may further include one or more handles. The handles may be located on a top portion, or any other portion, of the carriers. The handles may be used to carry the carrier when it is being utilized to transport items. The handle(s) may be detachable from the carrier and may be configured to be utilized as a door stop (e.g., which can be wedged beneath a door to prevent entry through the door) or other types of tools (e.g. such sleeve that houses a rechargeable battery pack, gauze, additional tourniquets, etc.).

[0029] In certain embodiments, the carriers may include armor components that can protect additional regions of an individual's body besides the torso region. For example, when configured as a protective vest, the carriers may include an extension or flap that extends down and covers an individual's groin, legs, buttocks or other region. The extension or flap may include an armor component which can protect the individual's groin, femoral arteries and/or other regions.

[0030] In certain embodiments, additional protection measures may be incorporated into any of the carriers described herein. For example, in certain embodiments, the carriers may be equipped with one or more weapons (e.g., guns, knives, pepper sprays or mace) and/or holsters for carrying the one or more weapons or items (e.g., flashlights).

[0031] While certain portions of this disclosure may describe an application of the self-defense technologies and inventive principles in connection with backpacks, the scope of the invention is not limited to such embodiments. Rather, the technologies and principles disclosed herein can be applied to any type of carrier or the like, including, but not limited to, any and all handbags, duffle bags, beach bags, satchels, purses, briefcases, luggage items, travel bags, tote bags, shoulder bags, laptop bags, wheeled or rolling bags, messenger bags, suitcases, technical packs, and transport containers.

[0032] The carriers disclosed herein may be separated into two portions along a fastener that extends vertically, horizontally or diagonally with respect to the carrier. For example, when a carrier is situated in an upright position, a fastener may extend vertically or horizontally around the carrier. The carrier can then be detached into two separate pieces along the fastener (e.g., into separate top and bottom pieces or into separate left and right pieces). Thus, regardless of where the fastener is situated, it may allow for a separation of the carrier.

[0033] It should be noted that the protective vests can be configured to be worn in a reversible fashion. For example, both the front and rear vest portions can be equipped against either side of an individual (i.e., either the individual's front side or an individual's rear side). The terms "front" and "rear" are not intended to be limiting and are intended to be used interchangeably.

[0034] In certain embodiments, an individual may download an application on a computing device (e.g., mobile phone, desktop computer, tablet,

smart watch or other computing device) and/or access a website which provides useful information and functions that can provide assistance to the individuals who are involved in an active shooter situation or other type of dangerous situation. The application and/or website may provide training assistance for utilizing a carrier that incorporates the technology described herein. For example, the application and website may provide instructions for converting the carrier into a protective vest, or vice versa. The application and/or website may also provide functions that assist the individual during an active shooter incident or other type of threat. For example, the application and website may permit the individual to transmit a request for first aid, or to notify police or others of on-going active shooter incidents or other potential threats.

[0035] The carriers described in this disclosure can be manufactured using any suitable technique. The various components of the carriers (e.g., the housing, armor portions, straps, etc.) can be constructed using different manufacturing techniques, and the components can then be combined and assembled to create the carriers. Exemplary techniques that may be utilized to manufacture the carriers or its components include any or all of the following: knitting and weaving techniques, molding techniques (e.g., blow molding, injection molding or compression molding techniques), casting techniques (e.g., in which liquid material is poured into a mold), 3D-printing or additive manufacturing techniques, and machining techniques (e.g., in which a piece of material is cut into a desired final shape and size).

[0036] The inventive principles discussed herein provide a variety of advantages. Importantly, carriers are provided that serve dual functions associated with transporting items and self-defense. The armor components of the protective vest serve to protect the individuals' vital organs from bullets, shrapnel, knives and other threats. Thus, individuals that find themselves caught in an active shooter situation, or other types of dangerous situations, are provided with self-defense capabilities to increase their chances of survival and decrease their chances of injury. Moreover, while many civilians and other individuals are not willing to wear or carry conventional protective vests on a regular basis (e.g., because they tend to be bulky and are not easy to transport), the present solution permits commonly used carriers to be transformed into protective vests when needed, thus making it practical for these individuals to carry protective vests on their persons. In addition, the design and configuration of the carriers allows for a quick and easy conversion into protective vests. This is important given that an individual may only have a limited amount of time to protect themselves in the event of an active shooter situation or other dangerous situation. In addition to providing body armor, the detachable straps of the bags are designed to assist injured victims, either as a tourniquet that can restrict blood circulation or as a dragging device that can assist with removing victims from dangerous locations. The designs of the straps further enable individuals to secure a door in a closed position, thereby preventing entry of an active shooter or other

dangerous individuals into protected areas. These and other advantages should be apparent from the disclosure herein.

[0037] It should be recognized that the embodiments described in this disclosure can be combined in various ways. Any aspect or feature that is described in connection with one embodiment can be incorporated into any other embodiment mentioned in this disclosure.

[0038] Referring now to the drawings in which like numerals represent the same or similar elements and initially to Figure 1, an exemplary backpack carrier 100 is disclosed that can be transformed into a protective vest. Several storage compartments 120, 160 and 170 are incorporated into the housing of the backpack 100 for carrying and transporting items. The storage compartments 120, 160 and 170 extend the vertical length of the backpack 100. The storage compartments can be sealed or unsealed with corresponding fasteners 125, 165 and 175. In this exemplary embodiment, the fasteners 125, 165 and 175 are zippers. Other types of fasteners may also be utilized (e.g., such as hook and loop connectors, snap connectors, buttons, quick release snaps, magnets, sleeve connectors, pull cord connectors).

[0039] The backpack 100 further includes a pair of external shoulder straps 110 which permit an individual to carry or transport the backpack 100, along with any items included therein, on his or her back. Each external shoulder strap 110 includes an upper connector 112 and a lower connector 114 which are utilized to couple the strap 110 to the backpack 100. In this exemplary embodiment, the upper and lower

connectors 112, 114 are buckle connectors that include corresponding male and female mating portions. However, any of the aforementioned fasteners (e.g., snap connectors, hook and loop connectors, button connectors, etc.), or other types of fasteners, can alternatively or additionally be utilized to couple the straps 110 to the backpack 100. The external shoulder straps 110 can be detached from the backpack 100 by disengaging the connectors 112, 114. As explained in further detail below, the detached shoulder straps 110 are designed to be utilized as tourniquets (e.g., for restricting blood circulation) and/or loop assemblies (e.g., for dragging injured persons or securing doors).

[0040] The backpack 100 includes another fastener 157 located near a central, vertical axis of the backpack 100. The fastener 157 provides access to a central compartment 150 and enables the backpack 100 to be detached into two separate portions, namely, a front vest portion and a rear vest portion. Connection components located on the interior walls of the compartment 150 can be used to reassemble the backpack 100 into a protective vest that can be worn as body armor or a ballistic shield. In this exemplary embodiment, the fastener 150 is a zipper. However, any of the aforementioned fasteners, or other types of fasteners, can alternatively or additionally be utilized to connect the portions of the backpack 100.

[0041] Figures 2 and 3 illustrate a side view of the backpack 100 when it is assembled as a protective vest. In these figures, the fastener 157 is disengaged, thus separating the backpack into a front vest portion 180 and a rear vest portion 190. The connection components included

within the central compartment 150 are utilized to connect the front vest portion 180 and the rear vest portion 190 in a configuration that can be worn as a protective vest.

[0042] In this exemplary embodiment, the connection components stored within the central compartment 150 include a pair of internal shoulder straps 151 and a pair of mid-section connectors 155. The connection components are preferably configured in a manner that can be adjusted to accommodate individuals of different sizes, heights and weights. Each of the shoulder straps 151 are attached to the interior surfaces of the front vest portion 180 and the rear vest portion 190, and include a separable buckle fastener 152. Again, any of the aforementioned fasteners, or other types of fasteners, can alternatively or additionally be incorporated into the interior shoulder straps 151.

[0043] The mid-section connectors 155 are attached to the interior surface of the rear vest portion 190. Each mid-section connector 155 includes a flap portion that can pivot horizontally and outwardly from the center of the surface. The ends of the mid-section connectors 155 include fasteners for coupling the mid-section connectors 155 to the front vest portion 180 and for securing the vest to an individual's body. For example, in this embodiment, the end of each mid-section connector 155 includes a piece of flexible material that can bend around the exterior surface of the front vest portion 180 and a hook and loop connector (e.g., Velcro® connector) which can be coupled to a corresponding hook and loop connector located on the exterior surface. Each strap may further include a corresponding portion of a buckle

connection that can be coupled together. Again, any of the aforementioned fasteners, or other types of fasteners, can alternatively or additionally be incorporated into the mid-section connectors 155. The mid-section connectors 155 may connect the front vest portion 180 and rear vest portion 190 in other ways as well. For example, in certain embodiments, the mid-section connectors 155 may attach to an interior portion of the front vest portion 180 (e.g., to an interior surface of the central compartment 150 located on the front vest portion 180).

[0044] The front vest portion 180 and the rear vest portion 190 include armor components which can protect an individual's torso and back. In certain embodiments, the mid-section connectors 155 may also include armor components to protect an individual's side areas. The armor components incorporated into the front vest portion 180, rear vest portion 190 and/or mid-section connectors 155 may include any type of plated or non-plated armor. In certain embodiments, the armor components are removable and can be upgraded by the individual.

[0045] Figures 4A and 4B illustrate the interior of the central compartment 150 of the backpack 100 when the backpack 100 is separated along the fastener 157. Specifically, Figure 4A illustrates an interior surface of the compartment 150 which is attached to the rear vest portion 190 and Figure 4B illustrates an interior surface of the compartment 150 which is attached to the front vest portion 180. In certain embodiments, the armor components are incorporated into these interior surfaces and/or are located immediately adjacent and behind these surfaces. For example, metal armored plates (e.g., which may be made of steel or

other metals) may be located behind the interior surfaces of the front and rear vest portions, or inserted into sleeves that are included on the surfaces. Likewise, soft armor components (e.g., Kevlar® or other high-strength fibers) may be integrated directly into the interior surfaces or included in sleeves that are located on the surfaces. The armor components may alternatively, or additionally, be incorporated into other portions of the front vest portion 180 and rear vest portion 190.

[0046] The surface of the rear vest portion 190 is attached to the mid-section connectors 155 and the female portion of the shoulder strap connector 152. The surface of the front vest portion 180 is attached to the male portion of the shoulder strap connector 152. The male and female portions of the shoulder strap connectors 152 can be coupled together to enable the vest to be worn on the shoulders of an individual. The mid-section connectors 150 may extend around and couple to an exterior portion of the front vest portion 180.

[0047] Figure 5 is a front view of an individual wearing a backpack 100 that is arranged as a protective vest in accordance with certain embodiments of the present invention. As mentioned above, the protective vest can be worn in either direction (e.g., with vest portion 180 secured to the individual's front or back). The front vest portion 180 may be outfitted with one or more armor portions to protect the individual from projectiles and other threats. Items included in a front compartment 120 may provide additional protection against projectiles and other threats. Items included in the rear compartments 160, 170 may similarly provide additional protection.

[0048] The front vest portion 180 includes two external shoulder straps 110. The external shoulder straps 110 are detachable via the connectors 112 and 114. In certain embodiments, one or more of the external shoulder straps 110 may be configured as a tourniquet that can be utilized as a constricting band to control bleeding. For example, a connector 112, 114 (e.g., a buckle connector) may enable a detached shoulder strap 110 to be arranged in a loop or ring that can be placed around an arm or leg of an injured individual. The size of the loop or ring can then be adjusted or tightened to restrict the individual's blood flow. The connector may be configured to lock the size of the loop or ring when it is in a tightened position. In certain embodiments, the strap 110 or other portion of the backpack 100 may further include a stick, handle or ratchet-like device that can be utilized to turn and tighten the loop or ring. The strap 110 may include a small ring or sleeve for receiving the device and which enables the device to tighten the tourniquet.

[0049] One or more of the external shoulder straps 110 may also be configured as a looping assembly that can be utilized to drag victims to safety, to secure doors, and/or for other functions. In certain embodiments, a connector 112, 114 (e.g., a buckle connector) may enable a detached shoulder strap 110 to be arranged in a loop or ring that can be placed around a door handle and tightened around the handle. An opposite end of the shoulder strap 110 may then be tethered or attached to a fixed or stationary structure. The length of the strap between the structure and the door handle can be adjusted

appropriately at one or more of the connectors 112, 114 to secure the door in a closed position.

[0050] The looping assemblies formed from the external shoulder straps 110 may also be utilized to drag injured individuals or other individuals. In certain embodiments, a connector 112, 114 (e.g., a buckle connector) may enable a detached shoulder strap 110 to be arranged in a loop or ring that can be placed around an individual's limb, wrist or ankle. The loop or ring may be arranged at the one end of the strap 110 and may be connected to a portion of the strap 110 which can be used to pull the individual to safety in the event of an active shooter situation or other dangerous situation.

[0051] Figure 6 is a flow diagram of a method 600 for transforming a carrier into a protective vest in accordance with certain embodiments of the present invention. A carrier is provided which includes a fastener 157 which provides access to a central compartment 150 which houses connectors (step 610). The step of providing a carrier may include generating, fabricating, manufacturing, creating, or utilizing the carrier. The carrier may represent any bag, case or container including any of those mentioned above. The front vest portion 180 and a rear vest portion 190 may be connected using any type of fastener, e.g., such as a zipper, hook and loop connectors, snap connectors, buttons, etc. Next, the fastener 157 is disengaged to separate the carrier into a front vest portion 180 and a rear vest portion 190 (step 620). Separating the carrier along the fastener 157 permits the connectors to be accessed. The carrier is reassembled into a protective vest by attaching the

connectors (step 630). Exemplary connectors may include a pair of shoulder straps 151 and a pair of mid-section connectors 155. An individual may then be equipped with the protective vest (step 640). For example, an individual may equip the vest by placing the individual's head between the shoulder straps 151, resting the shoulder straps 151 on the individual's shoulders, and securing the vest to the individual's body using the mid-section connectors 155.

[0052] It should be recognized that numerous variations can be made to the above-described systems and methods without departing from the scope of the invention.

* * * * *

[0053] While various novel features of the invention have been shown, described and pointed out as applied to particular embodiments thereof, it should be understood that various omissions and substitutions and changes in the form and details of the systems and methods described and illustrated, may be made by those skilled in the art without departing from the spirit of the invention. Amongst other things, the steps shown in the methods may be carried out in different orders in many cases where such may be appropriate. Those skilled in the art will recognize, based on the above disclosure and an understanding therefrom of the teachings of the invention, that the particular hardware and devices that are part of the system described herein, and the general functionality provided by and incorporated

therein, may vary in different embodiments of the invention. Accordingly, the particular system components are for illustrative purposes to facilitate a full and complete understanding and appreciation of the various aspects and functionality of particular embodiments of the invention as realized in system and method embodiments thereof. Those skilled in the art will appreciate that the invention can be practiced in other than the described embodiments, which are presented for purposes of illustration and not limitation.

WHAT IS CLAIMED IS:

1. A backpack that is configured to be transformed into a protective vest, the backpack comprising:

a compartment that houses one or more connectors;

a fastener that is configured to at least partially seal the compartment, wherein full disengagement of the fastener enables a complete separation of the backpack into at least two disconnected portions including a front vest portion and a rear vest portion, and wherein the one or more connectors enable the front vest portion to be coupled to the rear vest portion such that the backpack is reconfigured as a protective vest; and

at least one armor component that is incorporated into the front vest portion or the rear vest portion.

2. The backpack of claim 1, further comprising at least one detachable shoulder strap that includes a built-in tourniquet.

3. The backpack of claim 1, further comprising at least one detachable shoulder strap that includes a built-in loop assembly configured to provide assistance with dragging an individual or securing a door in a closed position.

4. The backpack of claim 1, further comprising a first shared wall located between a first storage compartment and the compartment and a second shared wall located between a second storage compartment and the compartment; and

wherein the at least one armor component is integrated with, or located adjacent to, the first or second shared wall.

5. The backpack of claim 1, further comprising:

a first storage compartment for storing one or more items within the front vest portion; and

a second storage compartment for storing one or more items within the rear vest portion, the compartment being located between the first storage compartment and the second storage department when the backpack is not separated; and

wherein, when the backpack is separated and reconfigured as the protective vest around an individual's body, the one or more items included in the first and second storage compartments provide an outer defensive barrier against projectiles or other threats.

6. The backpack of claim 1, wherein the connectors included in the compartment comprise:

a pair of mid-section connectors configured to connect the front vest portion to the rear vest portion near an individual's mid-section region; and

a pair of shoulder straps which are attached to interior walls of the compartment.

7. The backpack of claim 6, wherein each of the shoulder straps includes a first strap portion that is attached to an interior wall of the front vest portion, a second strap portion that is attached to an interior wall of the rear vest portion, and a strap fastener for connecting the first and second strap portions.

8. The backpack of claim 6, wherein the mid-section connectors include additional armor components to protect the individual's side regions.

9. A carrier that is configured to be transformed into a vest, the carrier comprising:

a compartment formed within two portions that are coupled together by a fastener which provides access to the compartment;

wherein at least one armor component is incorporated into one or the two portions and disengagement of the fastener enables a complete separation of the two portions from each other;

wherein one or more connectors included on interior walls of the compartment enable the two portions to be coupled together so as to form a vest.

10. The carrier of claim 9, further comprising at least one detachable shoulder strap that includes a built-in tourniquet.

11. The carrier of claim 9, further comprising at least one detachable shoulder strap that includes a built-in loop assembly configured to provide assistance with dragging an individual or securing a door in a closed position.

12. The carrier of claim 9, further comprising:

a first shared wall located between a first storage compartment and the compartment; and

a second shared wall located between a second storage compartment and the compartment; and

wherein the at least one armor component is integrated with, or located adjacent to, the first or second shared wall.

13. The carrier of claim 12, wherein one or more items included in the first and second storage compartments provide an outer defensive barrier against projectiles or other threats.

14. The carrier of claim 9, wherein the connectors included in the compartment comprise:

one or more mid-section connectors configured to connect the separated two portions together near an individual's mid-section region; and

a pair of shoulder straps attached to interior walls of the compartment.

15. The carrier of claim 14, wherein each of the shoulder straps includes a first strap portion that is attached to an interior wall of one of said two portions, a second strap portion that is attached to an interior wall of the other of said two portions, and a strap fastener for connecting the first and second strap portions.

16. The carrier of claim 14, wherein the one or more mid-section connectors include at least one additional armor component.

17. A method for providing a carrier that can be transformed into a protective vest, the method comprising:

providing a carrier that includes a compartment that houses one or more connectors, wherein:

a fastener provides access to the compartment;

disengagement of the fastener enables a complete separation of the carrier into two disconnected portions including a front vest portion and a rear vest portion;

coupling the front and rear vest portions together through the one or more connectors around an individual's body enables the carrier to be reassembled as a vest;

at least one armor component is incorporated into the front vest portion or the rear vest portion.

18. The method of claim 17, further comprising fabricating the carrier utilizing one or more manufacturing techniques.

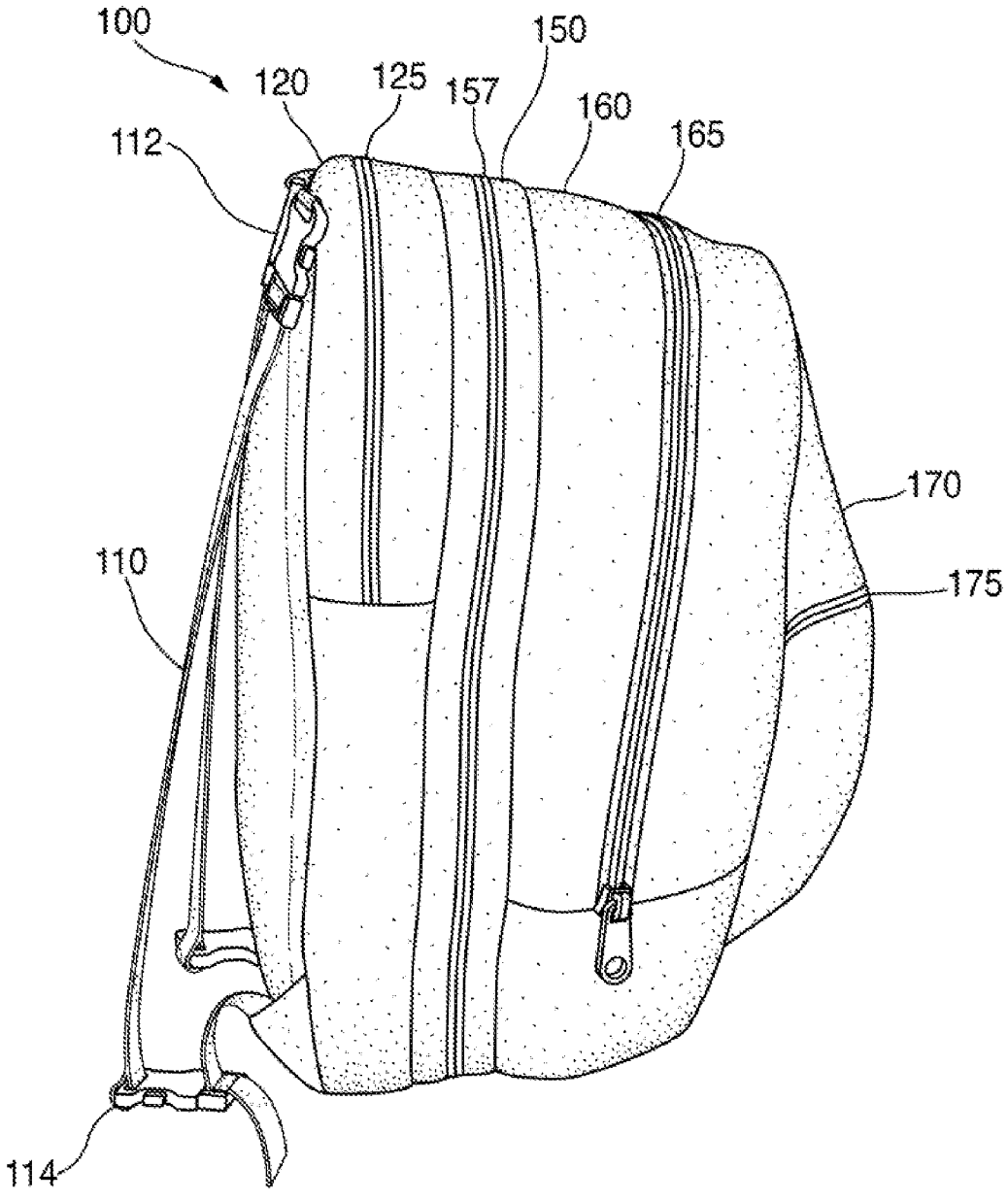


FIG. 1

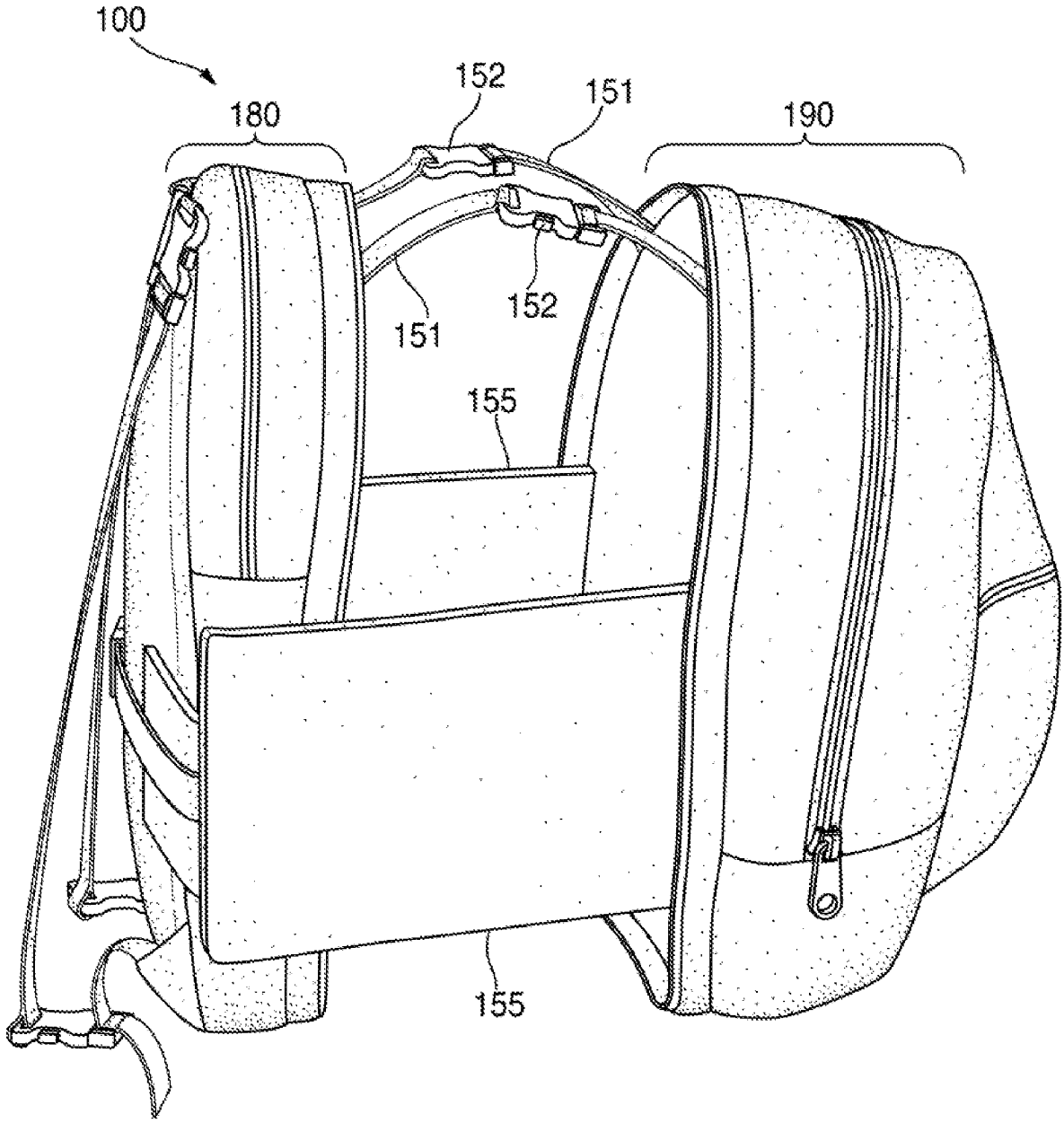


FIG. 2

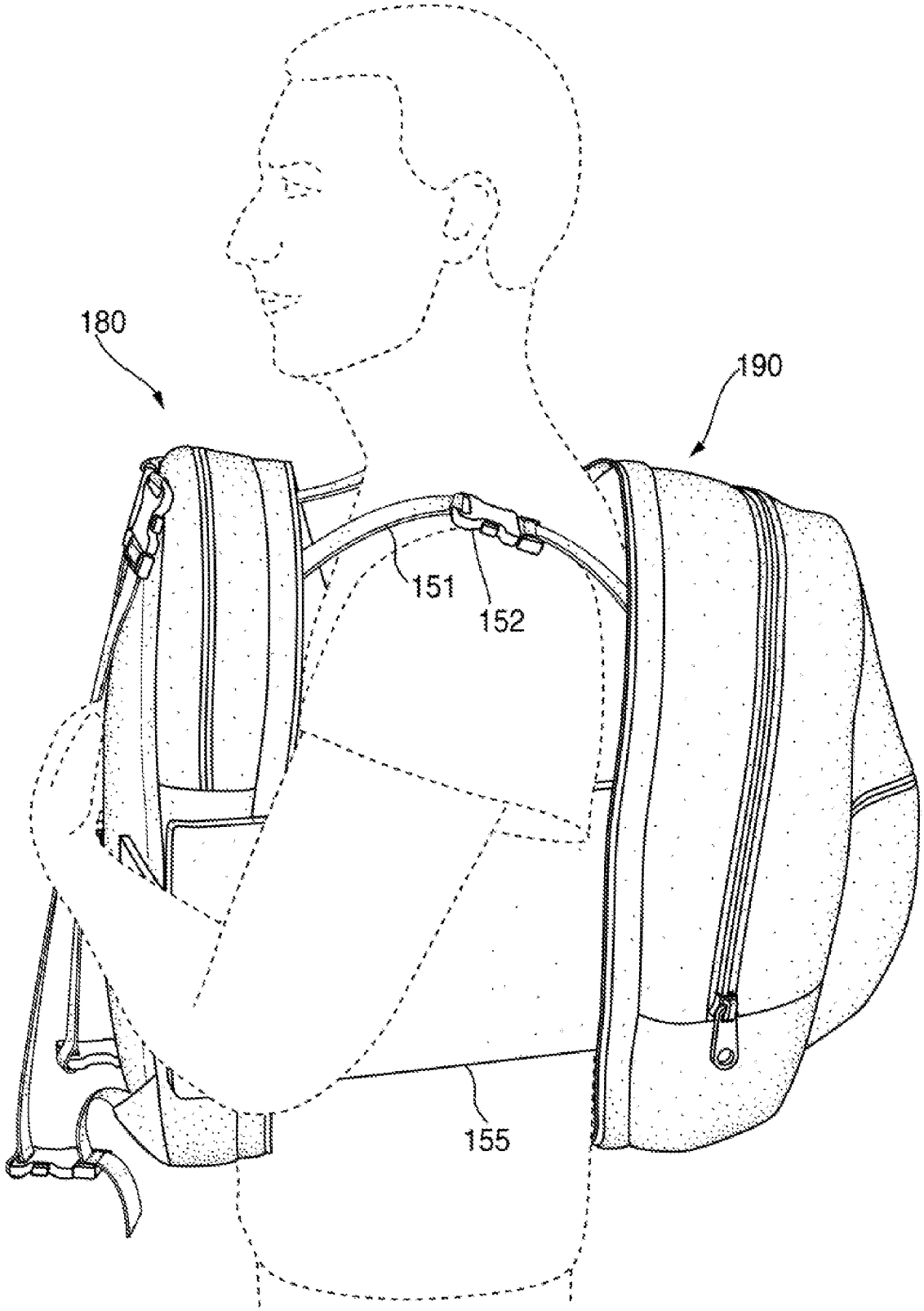


FIG. 3

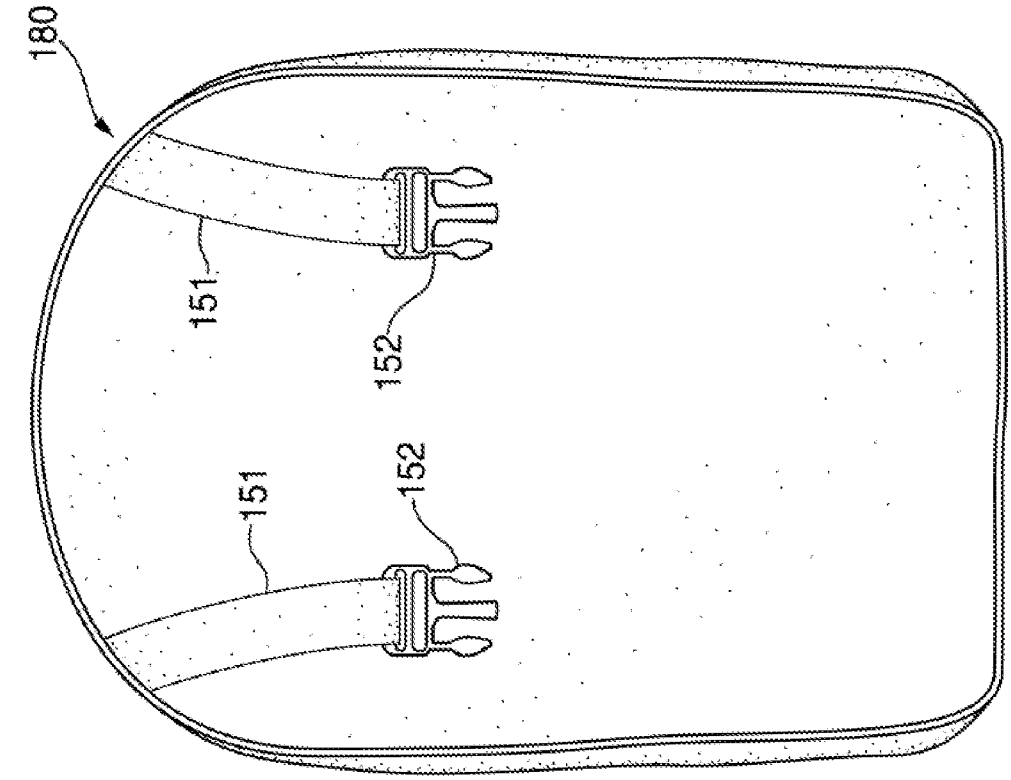


FIG. 4B

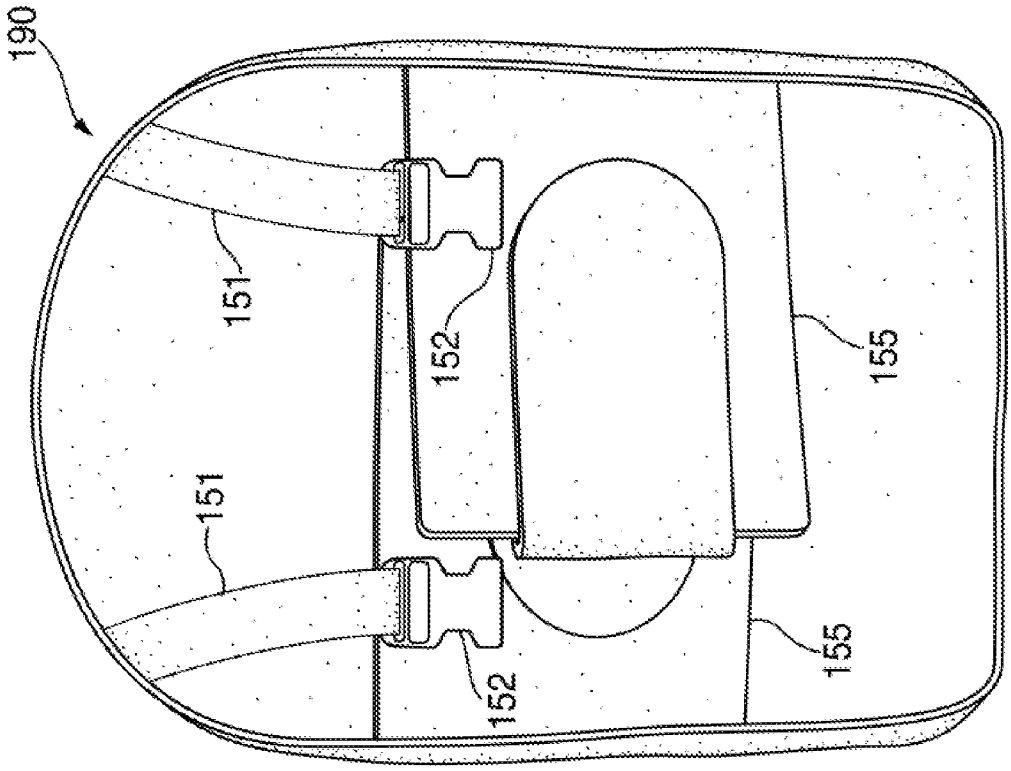


FIG. 4A

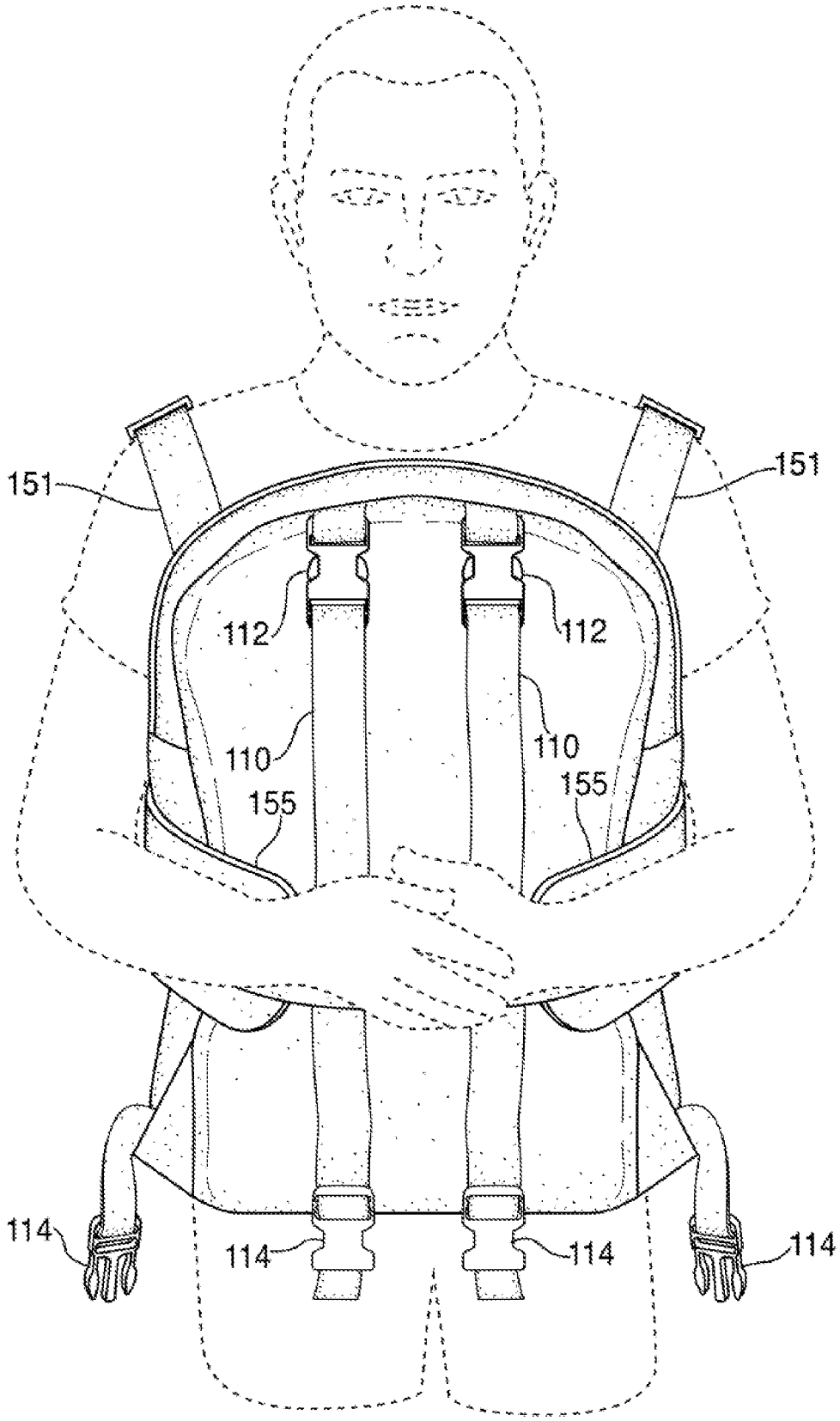


FIG. 5

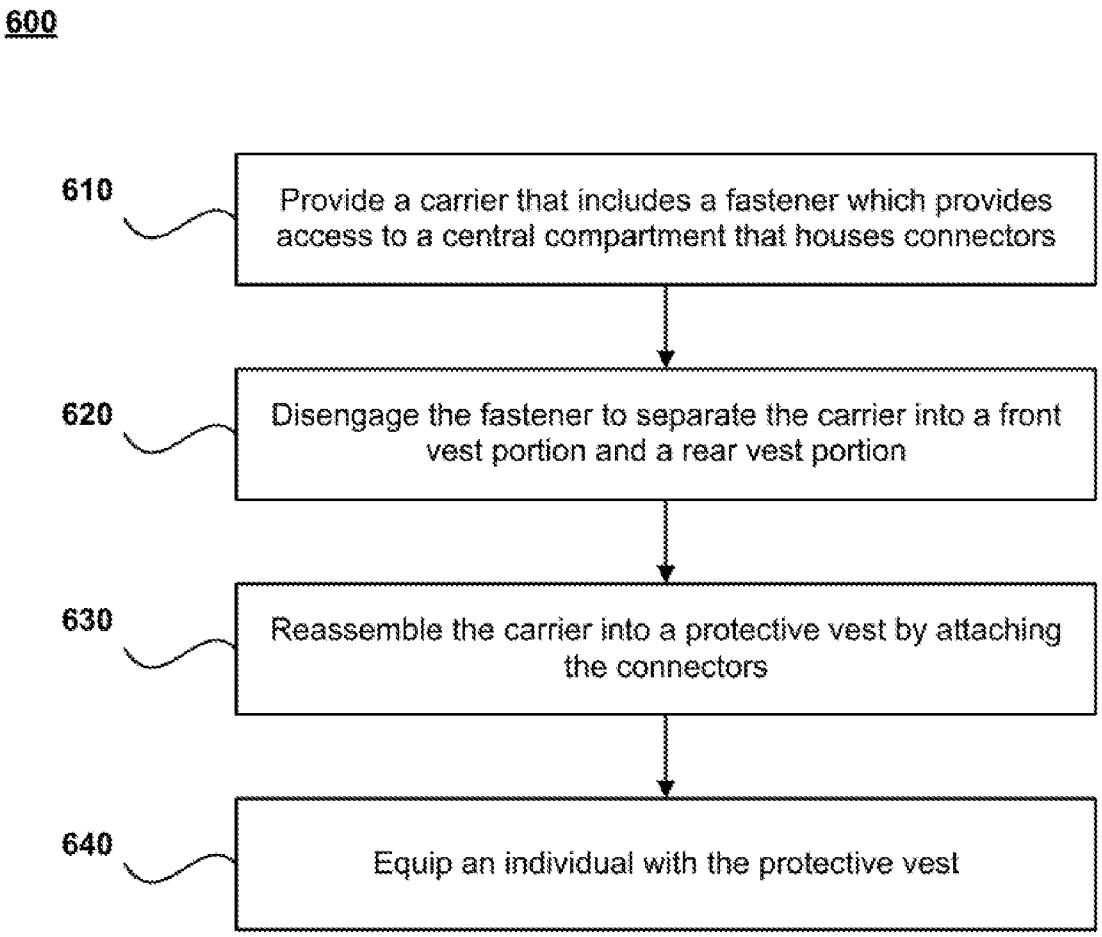

600
610
Provide a carrier that includes a fastener which provides access to a central compartment that houses connectors
620
Disengage the fastener to separate the carrier into a front vest portion and a rear vest portion
630
Reassemble the carrier into a protective vest by attaching the connectors
640
Equip an individual with the protective vest

FIGURE 6

INTERNATIONAL SEARCH REPORT	International application No. PCT/US17/24819

Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.c of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of:
   a. type of material
      ☐ a sequence listing
      ☐ table(s) related to the sequence listing
   b. format of material
      ☐ on paper
      ☐ in electronic form
   c. time of filing/furnishing
      ☐ contained in the international application as filed
      ☐ filed together with the international application in electronic form
      ☐ furnished subsequently to this Authority for the purposes of search

2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

INTERNATIONAL SEARCH REPORT	International application No. PCT/US17/24819

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US17/24819

A. CLASSIFICATION OF SUBJECT MATTER
IPC: **A45F 4/02**(2006.01)

CPC: 224/153
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
CPC : 224/153

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2015/0196077 A1 (McIntire, JR.) 16 July 2015, see entire document.	1-18

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
19 April 2017 (19.04.2017)	21 APR 2017
Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US Commissioner for Patents P.O. Box 1450 Alexandria, Virginia 22313-1450 Facsimile No. (571) 273-8300	Authorized officer Tom Barrett Telephone No. 571-272-4300

Form PCT/ISA/210 (second sheet) (April 2007)

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代理人 康艳青 姚开丽

(51)Int.Cl.
A45F 4/02(2006.01)

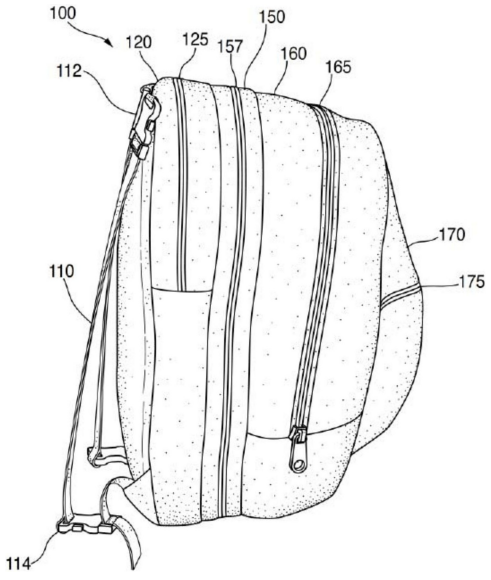
权利要求书2页 说明书7页 附图6页

(54)发明名称

组合的载具和防护背心

(57)摘要

提供了包或载具，其可以转变成防护背心并且可以用作身体装甲和防弹护甲。载具可以以使得人能存放和运输物品的第一布置来组装。载具可以快速且容易地转换成或配置成第二布置，其使得人能够将载具作为防护背心穿着。一个或多个肩带可以从载具上拆下以用作止血带、门口固定结构和用于拖曳受伤的受害者的工具。



CN 107920653 A

1.一种背包,其构形成转变成防护背心,所述背包包括:

容纳一个或多个连接器的隔间;

构形成至少部分地密封所述隔间的紧固件,其中,紧固件的完全分离使得所述背包完全分开成包括前背心部分和后背心部分的至少两个不连接的部分,并且其中,所述一个或多个连接器使得所述前背心部分能够耦接到所述后背心部分,以使得所述背包重新构形为防护背心;和

至少一个装甲部件,其结合到所述前背心部分或所述后背心部分中。

2.根据权利要求1所述的背包,还包括至少一个包括内置止血带的可拆卸的肩带。

3.根据权利要求1所述的背包,还包括至少一个可拆卸的肩带,所述肩带包括内置的环组件,其构形成提供帮助来拖曳人或将门固定在关闭位置中。

4.根据权利要求1所述的背包,还包括位于第一存放隔间与所述隔间之间的第一共用壁和位于第二存放隔间与所述隔间之间的第二共用壁;并且

其中,所述至少一个装甲部件与所述第一共用壁或所述第二共用壁结合,或位置与所述共用壁第一或所述第二共用壁相邻。

5.根据权利要求1所述的背包,还包括:

用于将一个或多个物品存放在所述前背心部分内的第一存放隔间;和

用于将一个或多个物品存放在所述后背心部分中的第二存放隔间,当所述背包未被分开时,所述隔间位于所述第一存放隔间和所述第二存放隔间之间;并且

其中,当所述背包被分开并重新构形为围绕人身体的防护背心时,包含在所述第一存放隔间和所述第二存放隔间中的所述一个或多个物品提供抵抗射弹或其它威胁的外部防御性屏障。

6.根据权利要求1所述的背包,其中,包含在所述隔间中的连接器包括:

一对中间部段连接器,其构形成在人的中间部段的区域附近将所述前背心部分连接到所述后背心部分;和

一对肩带,其附接到所述隔间的内壁。

7.根据权利要求6所述的背包,其中,每个所述肩带包括附接到所述前背心部分的内壁的第一带部分、附接到所述后背心部分的内壁的第二带部分和用于连接所述第一带部分和第二带部分的带紧固件。

8.根据权利要求6所述的背包,其中,所述中间部段连接器包括用于保护人的侧面区域的附加装甲部件。

9.一种载具,其被构形成转变成背心,所述载具包括:

形成在两个部分内的隔间,所述两个部分通过紧固件耦接在一起,所述紧固件提供通向所述隔间的通路;

其中,至少一个装甲部件被结合到一个或所述两个部分中,并且所述紧固件的分离使得所述两个部分彼此能够完全分开;

其中,包含在所述隔间的内壁上的一个或多个连接器使得所述两个部分能够耦接在一起以便形成背心。

10.根据权利要求9所述的载具,还包括至少一个包括内置止血带的可拆卸的肩带。

11.根据权利要求9所述的载具,还包括至少一个可拆卸的肩带,所述肩带包括内置的

环组件，其构形成提供帮助来拖曳人或将门固定在关闭位置中。

12.根据权利要求9所述的载具，还包括：

位于第一存放隔间与所述隔间之间的第一共用壁；和

位于第二存放隔间与所述隔间之间的第二共用壁；并且

其中，所述至少一个装甲部件与所述第一共用壁或所述第二共用壁结合，或位置与所述第一共用壁或所述第二共用壁相邻。

13.根据权利要求12所述的载具，其中，包含在所述第一存放隔间和所述第二存放隔间中的一个或多个物品提供抵抗射弹或其它威胁的外部防御性屏障。

14.根据权利要求9所述的承载件，其中，包含在所述隔间中的连接器包括：

一个或多个中间部段连接器，其构形成在人的中间部段的区域附近将所述分开的两个部分连接在一起；和

一对肩带，其附接到所述隔间的内壁。

15.根据权利要求14所述的载具，其中，每个所述肩带包括附接到所述两个部分之一的内壁上的第一带部分、附接到所述两个部分中的另一个的内壁上的第二带部分和用于连接所述第一带部分和所述第二带部分的带紧固件。

16.根据权利要求14所述的载具，其中，所述一个或多个中间部段连接器包括至少一个附加装甲部件。

17.一种用于提供能够转变成防护背心的载具的方法，该方法包括：

提供载具，所述载具包括容纳一个或多个连接器的隔间，其中：

紧固件提供通向所述隔间的通路；

所述紧固件的分离使得所述载具能够完全分开成包括前背心部分和后背心部分的两个不连接部分；

通过所述一个或多个连接器围绕人的身体将所述前背心部分和后背心部分耦接在一起使得所述载具能够被重新组装为背心；

至少一个装甲部件被结合到所述前背心部分或所述后背心部分中。

18.根据权利要求17所述的方法，还包括利用一种或多种制造技术制造所述载具。

组合的载具和防护背心

[0001] 相关申请的交叉引用

[0002] 本申请要求于2016年8月9日提交的申请号为15/232,548的美国专利申请的权益。上述申请的内容通过引用方式整体并入本文。

技术领域

[0003] 本发明涉及可用于保护的附件，更特别地涉及可以转变为防护背心的包或其他载具，该防护背心可作为身体装甲或防弹护甲穿戴并且配备有在危险情况下提供援助的工具。

背景技术

[0004] 利用防弹背心来保护人免受射弹(例如，来自枪的子弹或来自爆炸的弹片)、刺伤和其他形式的伤害。这些背心包括可以覆盖人的躯干、背部和侧面区域的装有板或未装板的装甲区域，以便保护人的重要器官。军事或警察人员在牵涉到危险或潜在危险的情况中之前最常穿着该背心。

[0005] 由于该背心是为军事或警察人员设计的，所以背心往往是沉重、厚重的，并且除非被穿着，否则不易运输。虽然平民(或其他非军事或非警察人员)为了自身安全有能力购买这些防护背心，但这些人很少选择这样做，因为他们经常携带和/或穿着防护背心是不切实际的。因此，如果他们陷入无特定目标的随机犯罪射手情况或其他危险情况(例如大规模的伤亡事件)，这些人通常得不到保护。

[0006] 近年来，在美国和世界其他地区，无特定目标的随机犯罪射手情况的数量急剧增加。许多这些无特定目标的随机犯罪射手情况是外国和/或本地恐怖分子活动的结果。为了造成尽可能多的伤亡的目标，无特定目标的随机犯罪射手经常选择充满了不带武器和/或无保护的平民的“软目标”(例如学校、体育场或机场)。陷入这些情况中的平民常常无法保护自己。

[0007] 鉴于上述情况，需要为人提供运输和配置防护背心的实际手段，该防护背心可以在无特定目标的随机犯罪射手情况和其他危险情况中用于防护。

发明内容

[0008] 本发明涉及可以转变成防护背心的包和其他载具，所述防护背心可以用作身体装甲和/或防弹护甲，并且配备有在危险情况下有用的附加工具。载具可以布置、组装和配置在第一构形中，当载具未用作防护背心时，第一构形允许在载具内存放和运输物品。在无特定目标的随机犯罪射手情况或其他危险情况下，载具可以快速且容易地转换为或配置为允许载具被用作防护背心的第二构形。载具包括紧固件，其能够分离以将载具分开成前背心部分和后背心部分。载具的内部包括用于重新组装前背心部分和后背心部分以产生防护背心的连接器。当穿着防护背心时，包含在载具的存放隔间内的物品能够提供抵抗射弹或其他威胁的额外的防御性屏障。附接在载具上的肩带可以拆卸。肩带可以包括内置的止血带，

和/或可用于将门固定在关闭位置或将受伤的受害者拖曳到安全位置的环组件。

[0009] 根据某些实施方案，背包构形成转变成防护背心。背包包括容纳一个或多个连接器的隔间和紧固件，紧固件构形成至少部分地密封该隔间。紧固件的完全分离使得背包完全分开成包括前背心部分和后背心部分的至少两个不连接的部分。所述一个或多个连接器使得前背心部分能够耦接到后背心部分，以使得背包重新构形成防护背心。至少一个装甲部件结合到前背心部分或后背心部分中。

[0010] 根据某些实施方案，载具被构形成转变成背心。载具包括形成在两个部分内的隔间，所述两个部分通过紧固件耦接在一起，紧固件提供通向隔间的通路。至少一个装甲部件被结合到一个或两个部分中，并且紧固件的分离使得两个部分能够彼此完全分开。包含在隔间的内壁上的一个或多个连接器使得两个部分能够耦接在一起以便形成背心。

[0011] 根据某些实施方案，公开了一种用于提供能够转变成防护背心的载具的方法。该方法包括提供载具的步骤，载具包括容纳一个或多个连接器的隔间。紧固件提供通向隔间的通路并且紧固件的分离使得载具能够完全分开成包括前背心部分和后背心部分的两个不连接部分。通过一个或多个连接器围绕人的身体将前和后背心部分耦接在一起使得载具能够被重新组装为背心。至少一个装甲部件被结合到前背心部分或后背心部分中。

[0012] 从以下结合附图阅读的说明性实施方案的详细描述中，这些和其它特征和优点将变得显而易见。

附图说明

[0013] 在附图中示出了本发明的原理，附图是示例性的而不是限制性的，其中相同的附图标记用于表示相同或相应的部件，其中：

[0014] 图1是根据本发明的某些实施方案的载具的侧视图。

[0015] 图2是根据本发明的某些实施方案的被布置为防护背心的载具的侧视图。

[0016] 图3是穿着根据本发明的某些实施方案的被布置为防护背心的载具的人的侧视图。

[0017] 图4A和4B示出了根据本发明的某些实施方案的示例性载具的内部布置。

[0018] 图5是穿着根据本发明的某些实施方案的被布置为防护背心的载具的人的前视图。

[0019] 图6是根据本发明的某些实施方案的将载具转变成防护背心的方法的流程图。

具体实施方式

[0020] 本发明涉及可以转变成防护背心的包和其他类型的载具，所述防护背心可用作身体装甲和防弹护甲。在第一构形中，载具被布置成存放和运输物品(例如，布置为允许运输物品的背包、包或箱子)。当威胁即将来临时，载具可以迅速且容易地转换或配置为用作防护背心的第二构形，所述防护背心可作为身体装甲穿着以提供防止射弹和其他威胁的保护。

[0021] 载具可以分开成两个不同的零件或部分：前背心部分和后背心部分。当载具未被用作防护背心时，紧固件将前背心部分与后背心部分结合或连接起来。前背心部分和后背心部分可以用任何类型的紧固件连接，包括但不限于拉链、钩环连接器(例如维可牢®)、

卡扣连接器、按钮、快拆卡扣、磁体、套筒连接器、带扣连接器、拉绳连接器(例如,当拉绳时分开)和/或任何其他类型的连接器。在人希望转变载具将其用作身体装甲的情况下,人可以使紧固件分离以将包的前背心部分与包的后背心部分断开连接或分开。然后可以重新组装并连接前背心部分和后背心部分以形成可穿着的防护背心。可以利用位于载具的中央隔间内的连接器将载具重新组装为防护背心。

[0022] 载具可以配备或结合有一个或多个装甲部件。在某些实施方案中,载具包括前装甲部件(例如,其可位于前背心部分中)以及后装甲部件(例如,其可以位于后背心部分中),当载具作为背心穿着时,前装甲部件用于保护人的胸部和前部区域,当载具作为背心穿着时,后装甲部件用于保护人的背部和后部区域。载具可以另外包括装甲部件以保护人的侧面区域或人身体的其他区域。装甲部件可以由任何装有板或未装板的装甲材料组成或包括任何装有板或未装板的装甲材料。可以结合到装甲部件中的示例性材料可以单独地或组合地包括以下任何材料:金属(例如钢、铁和钛)、塑料(例如聚乙烯)、高强度纤维(例如凯夫拉尔(Kevlar)®、芳族聚酰胺或对位芳族聚酰胺纤维和烃纤维)和/或可以提供对射弹等的防护的任何其它材料。装甲部件可以永久地结合到载具中和/或可以是可拆卸的以允许更换或升级。

[0023] 载具的外壳可以由任何合适的材料构成。在某些实施方案中,外壳可以由任何类型的纺织品、布或织物构成,包括但不限于尼龙、棉、涤纶、羊毛、皮革或帆布。在某些实施方案中,外壳可以替代地或另外由刚性材料构成或包括刚性材料,刚性材料例如塑料、木材或金属材料。在某些实施方案中,外壳可以替代地或另外由装甲材料构成或包括装甲材料,包括但不限于任何装有板或未装板的装甲材料。

[0024] 载具的一些或所有部分可以是防水的。在某些实施方案中,载具可以包括容纳金属或装有板的装甲部件的部段或隔间(例如,位于包的中央隔间的内壁中或附近),并且所述部段或隔间可以构形成是防水的,以防止在载具浸入水中或以其他方式遭受液体的情况下损坏装甲部件。在某些实施方案中,载具的外壳可以另外或替代地是防水的。

[0025] 在某些实施方案中,每个载具可以包括用于容纳或运输物品的一个或多个存放隔间。隔间的尺寸可以根据载具的类型而变化。可以用任何上述紧固件或任何其它类型的紧固件来密封或封闭存放隔间。当载具转换成背心时,包含在隔间内的任何物品都可以保留在其中,以便提供抵抗射弹等的额外保护。

[0026] 每个载具还可以包括容纳用于将载具重新组装成防护背心的连接器的隔间。具体地说,当用紧固件将载具的前背心部分和后背心部分结合时,在前背心部分和后背心部分之间形成隔间。一对肩带和一对中间部段连接器存放在隔间内。肩带和中间部段连接器可以附接到隔间的内壁并与其结合(例如,在前背心部分和/或后背心部分的表面上)。肩带和中间部段连接器在载具分开后被露出或成为可接近。然后可以通过用肩带和中间部段连接器将前背心部分和后背心部分连接起来而将分开的部分组装成防护背心。可以调节肩带和中间部段连接器以适应穿着背心的人的身高和体重。

[0027] 除了包含在隔间内以使得能组装防护背心的肩带之外,载具的外部还可以包括一个或多个带,其在载具未被用作防护背心时辅助人运输载具。例如,背包载具可以包括一对肩带,以使人能将背包背在他或她的背上。类似地,手包载具(例如,挎包或钱包)可以包括使得人能将手包挎在他或她的肩部上的(一个或多个)肩带。

[0028] 在某些实施方案中，这些外部带中的一个或多个可以与载具分离，并且可以包括内置的止血带和/或内置的环组件。在无特定目标的随机犯罪射手或其他危险情况下，可以将具有内置止血带的带从载具拆下以帮助受伤人员。类似地，具有内置环组件的带可以从载具拆下并用于固定门把手，以便防止通过门口进入，或者作为可以帮助人拖曳受伤的受害者的系绳。

[0029] 每个载具还可以包括一个或多个把手。把手可以位于载具的顶部部分或任何其它部分上。把手可以用于在载具用于运输物品时携带载具。(一个或多个)把手可以从载具上拆卸下来，并且可以构形成用作门止挡件(例如，其可以楔入门下方以防止通过门进入)或其他类型的工具(例如，容纳可再充电电池组、纱布、额外的止血带等的套筒)。

[0030] 在某些实施方案中，载具可以包括能够保护除了躯干区域之外的人身体的另外的区域的装甲部件。例如，当构形为防护背心时，载具可以包括向下延伸并覆盖人的腹股沟、腿、臀部或其他区域的延伸部或片板。延伸部或片板可以包括能够保护人的腹股沟、股动脉和/或其他区域的装甲部件。

[0031] 在某些实施方案中，附加的保护措施可以结合到本文所述的任何载具中。例如，在某些实施方案中，载具可以配备一个或多个武器(例如枪、刀、胡椒喷雾或钉头锤)和/或用于携带一个或多个武器或物品(例如手电筒)的皮套。

[0032] 尽管本发明的某些部分可能描述了与背包有关的自卫技术和发明原理的应用，但是本发明的范围不限于这些实施方案。而是，本文公开的技术和原理可以应用于任何类型的载具等，包括但不限于任何和所有手包、行李包、沙滩包、挎包、钱包、公文包、行李物品、旅行包，手提包，单肩包、笔记本电脑包，轮式或滚动式包、邮差包、手提箱、露营(technical)包和运输容器。

[0033] 本文公开的载具可以沿着相对于载具垂直地、水平地或对角地延伸的紧固件分开成两部分。例如，当载具位于直立位置中时，紧固件可以绕载具垂直或水平地延伸。然后可以将载具沿着紧固件分开成两个分开的零件(例如，分开成分离的顶部和底部零件或分离的左侧和右侧零件)。因此，无论紧固件位于何处，它都可以允许载具的分开。

[0034] 应当注意，防护背心可以构形成以可反穿的方式穿着。例如，前背心部分和后背心部分都可以配备成靠在人的任一侧(即，人的前侧或人的后侧)。术语“前”和“后”不是限制性的，并且可以互换地使用。

[0035] 在某些实施方案中，人可以在计算设备(例如，移动电话、台式计算机、平板电脑、智能手表或其他计算设备)上下载应用和/或访问提供有用的信息和功能的网站，所述信息和功能可以对被卷入无特定目标的随机犯罪射手情况或其他类型危险情况的人提供帮助。应用和/或网站可以提供使用包含本文中所述技术的载具的培训援助。例如，应用和网站可以提供将载具转变成防护背心或将防护背心转变成载具的用法说明。应用和/或网站还可以提供在无特定目标的随机犯罪射手事件或其他类型的威胁期间帮助人的功能。例如，应用和网站可以允许人发送急救请求，或者通知警察或其他人正在进行的无特定目标的随机犯罪射手事件或其他潜在的威胁。

[0036] 本发明中描述的载具可以利用任何合适的技术制造。可以利用不同的制造技术构造载具的各种部件(例如，外壳、装甲部分、带等)，然后可以组合和组装这些部件以形成载具。可用于制造载具或其部件的示例性技术包括以下中的任一个或全部：针织和编织技术、

模制技术(例如吹塑、注塑或压塑技术)、铸造技术(例如,在其中将液体材料浇入模具中),3D打印或增材制造技术以及机加工技术(例如,在其中将一块材料切割成期望的最终形状和尺寸)。

[0037] 本文中讨论的发明原理提供了各种优点。重要的是,提供了发挥与运输物品和自卫相关的双重功能的载具。防护背心的装甲部件用于保护人的重要器官免受子弹、弹片、刀和其它威胁。因此,为发现自己陷入无特定目标的随机犯罪射手情况或其他类型的危险情况的人提供了自卫能力,以增加他们的生存机会并降低他们的受伤机会。此外,虽然许多平民和其他人不愿意经常穿着或携带常规防护背心(例如,因为它们往往是厚重的而且不易于运输),但本解决方案允许常用的载具在需要时转变为防护背心,因而使这些人随身携带防护背心变得实际。此外,载具的设计和构形允许快速且容易地转变为防护背心。这是重要的,因为在无特定目标的随机犯罪射手情况或其他危险的情况下,人只有有限的时间来保护他们自己。除了提供身体装甲之外,包的可拆卸带被设计成帮助受伤的受害者,作为可以限制血液循环的止血带,或作为可以帮助将受害者从危险位置移开的拖曳装置。带的设计进一步使得人能够将门固定在关闭位置中,从而防止无特定目标的随机犯罪射手或其他危险人员进入保护区域。根据本发明的公开内容,这些和其它优点将是显而易见的

[0038] 应当认识到,本发明中描述的实施方案可以以各种方式组合。结合一个实施方案描述的任何方面或特征可并入本文中提到的任何其它实施方案中。

[0039] 现在参考附图,其中相同的附图标记代表相同或相似的元件,首先参考图1,公开了可以转变成防护背心的示例性背包载具100。几个存放隔间120,160和170被结合到背包100的外壳中用于携带和运输物品。存放隔间120,160和170延伸背包100的垂直长度。存放隔间可用对应的紧固件125,165和175进行密封或不进行密封。在该示例性实施方案中,紧固件125,165和175是拉链。也可以使用其它类型的紧固件(例如,钩环连接器、卡扣连接器、按钮、快拆卡扣、磁体、套筒连接器、拉绳连接器)。

[0040] 背包100还包括一对外部肩带110,其允许人在他或她的背上携带或运输背包100以及包含在其中的任何物品。每个外部肩带110包括用于将带110耦接到背包100的上连接器112和下连接器114。在该示例性实施方案中,上连接器112和下连接器114是带扣连接器,其包括对应的阳和阴配合部分。然而,可以替代地或另外使用任何上述紧固件(例如,卡扣连接器、钩环连接器、按钮连接器等)或其他类型的紧固件来将带110耦接到背包100上。通过将连接器112、114分离,外部肩带110可以从背包100拆下。如下面更详细地说明的,拆下的肩带110设计成用作止血带(例如,用于限制血液循环)和/或环组件(例如,用于拖曳受伤人员或固定门)。

[0041] 背包100包括位于背包100的中心垂直轴线附近的另一个紧固件157。紧固件157提供通向中央隔间150的通路,并使背包100能够分离成两个分开的部分,即前背心部分和后背心部分。位于隔间150的内壁上的连接部件可以用于将背包100重新组装成可以作为身体装甲或防弹护甲穿着的防护背心。在该示例性实施方案中,紧固件150是拉链。然而,任何上述紧固件或其他类型的紧固件可以替代地或另外用于连接背包100的各部分。

[0042] 图2和图3示出了当背包100组装为防护背心时的背包100的侧视图。在这些图中,紧固件157分离,从而将背包分开成前背心部分180和后背心部分190。在可以作为防护背心穿着的构形中,包含在中央隔间150内的连接部件用于连接前背心部分180和后背心部分

190。

[0043] 在该示例性实施方案中，存放在中央隔间150内的连接部件包括一对内部肩带151和一对中间部段连接器155。连接部件优选地以下列方式构形，即可以被调节以适应不同大小、身高和体重的人。每个肩带151都附接到前背心部分180和后背心部分190的内表面上，并且包括可分离的带扣紧固件152。同样，任何上述紧固件或其他类型的紧固件都可以替代地或另外结合到内部肩带151中。

[0044] 中间部段连接器155附接到后背心部分190的内表面。每个中间部段连接器155包括可从表面的中心水平和向外枢转的片板部分。中间部段连接器155的端部包括用于将中间部段连接器155耦接到前背心部分180和用于将背心固定到人身体的紧固件。例如，在该实施方案中，每个中间部段连接器155的端部包括能够围绕前背心部分180的外表面弯曲的柔性材料片和钩环连接器(例如，维可牢®连接器)，该钩环连接器可以耦接到位于外表面上的对应的钩环连接器。每个带还可以包括可以耦接在一起的带扣连接的对应部分。同样，任一种上述紧固件或其它类型的紧固件可以替代地或另外结合到中间部段连接器155中。中间部段连接器155也可以以其它方式连接前背心部分180和后背心部分190。例如，在某些实施方案中，中间部段连接器155可以附接到前背心部分180的内部部分(例如，附接到位于前背心部分180上的中央隔间150的内表面)。

[0045] 前背心部分180和后背心部分190包括能够保护人的躯干和背部的装甲部件。在某些实施方案中，中间部段连接器155还可以包括保护人侧面区域的装甲部件。结合到前背心部分180、后背心部分190和/或中间部段连接器155中的装甲部件可以包括任何类型的装有板的或未装板的装甲。在某些实施方案中。装甲部件是可拆卸的，并且可以由人升级。

[0046] 图4A和4B示出了当背包100沿着紧固件157分开时背包100的中央隔间150的内部。具体地，图4A示出了附接到后背心部分190的隔间150的内表面，图4B示出了附接到前背心部分180的隔间150的内表面。在某些实施方案中，装甲部件结合到这些内表面中和/或位置紧邻这些表面并且位于这些表面之后。例如，可以将金属装甲板(例如，其可以由钢或其他金属制成)放置于前和后背心部分的内表面的后面，或插入到在所述表面上包含的套筒(sleeve)中。同样，柔软的装甲部件(例如，凯夫拉尔®或其它高强度纤维)可以直接结合到内表面中或包含在位于所述表面上的套筒中。替代地或另外，装甲部件可以结合到前背心部分180和后背心部分190的其他部分中。

[0047] 后背心部分190的表面附接到中间部段连接器155和肩带连接器152的阴部分。前背心部分180的表面附接到肩带连接器152的阳部分。肩带连接器152的阳和阴部分可以耦接在一起，以使背心穿着在人的肩上。中间部段连接器150可以围绕前背心部分180的外部部分延伸并耦接到其上。

[0048] 图5是穿着根据本发明的某些实施方案的被布置为防护背心的背包100的人的前视图。如上所述，防护背心可以沿任一方向(例如，背心部分180固定到人的前面或背部)穿着。前背心部分180可以配备有一个或多个装甲部分，以保护人免受射弹和其他威胁。包含在前隔间120中的物品可以提供抵抗射弹和其他威胁的额外保护，包含在后隔间160,170中的物品可以类似地提供额外的保护。

[0049] 前背心部分180包括两个外部肩带110，外部肩带110可经由连接器112和114拆卸。在某些实施方案中，外部肩带110中的一个或多个可以构形为止血带，其可以用作收缩带来

控制出血。例如，连接器112,114(例如，带扣连接器)可以使拆下的肩带110能够布置成可以围绕伤者的臂或腿放置的环或圈，然后可以调节或收紧环或圈的大小以限制人的血流。连接器可以构形成当环或圈处于收紧位置中时锁定环或圈的尺寸。在某些实施方案中，带110或背包100的其它部分可进一步包括可用于转动和收紧环或圈的杆、把手或棘轮状装置。带110可以包括用于接收所述装置的小环或套筒，并且使得所述装置能够收紧止血带。

[0050] 外部肩带110中的一个或多个也可以构形为可用于将受害者拖曳到安全位置、固定门和/或用于其他功能的成环组件。在某些实施方案中，连接器112,114(例如，带扣连接器)可以使拆下的肩带110能布置成可围绕门把手放置并收紧在把手周围的环或圈，然后可以将肩带110的另一端系到或附接到固定或静止结构上。所述结构和门把手之间的带长度可以在一个或多个连接器112,114处适当地调节，以将门固定在关闭位置中。

[0051] 由外部肩带110形成的成环组件也可用于拖曳受伤的人或其他人。在某些实施方案中，连接器112,114(例如，带扣连接器)可以使拆下的肩带110能布置成可以围绕人的肢体、手腕或脚踝放置的环或圈。环或圈可以布置在带110的一端，并且可以连接到带110的一部分，其可用于在无特定目标的随机犯罪射手情况或其他危险情况下将人拉到安全位置。

[0052] 图6是根据本发明的某些实施方案的用于将载具转变成防护背心的方法600的流程图。提供一种包括紧固件157的载具，紧固件157提供了通向容纳连接器的中央隔间150的通路(步骤610)。提供载具的步骤可以包括产生、制作、制造、创建或利用载具。载具可以代表包括上述任何一个的任何包、箱子或容器。可以利用任何类型的紧固件连接前背心部分180和后背心部分190，例如拉链、钩环连接器、卡扣连接器、按钮等。接下来，紧固件157分离以将载具分开成前背心部分180和后背心部分190(步骤620)。将载具沿着紧固件157分开允许接近连接器。通过附接连接器，将载具重新组装成防护背心(步骤630)。示例性的连接器可以包括一对肩带151和一对中间部段连接器155。然后人可以装备防护背心(步骤640)。例如，人可以通过将人的头置于肩带151之间，将肩带151搁在人的肩上，并利用中间部段连接器155将背心固定到人的身体上来装备背心。

[0053] 应当认识到，在不脱离本发明的范围的情况下，可以对上述系统和方法作出许多变化。

[0054] 尽管本发明的各种新颖的特征已被示出、描述和指出为应用于其特定的实施方案，但应该懂得，本领域技术人员可以对所描述和示出的系统和方法的形式和细节作出各种省略、替换和改变，而不背离本发明的精神。除此之外，在许多情况下(其中以不同的顺序执行方法中的步骤可能是适当的)，方法中所示的步骤可以以不同的顺序执行。基于上述公开内容和对本发明的教导的理解，本领域技术人员将认识到，作为本文所述的系统的一部分的特定硬件和装置以及由其提供并且并入其中的一般功能在本发明的不同实施方案中可以是不同的。因此，特定的系统部件是为了说明性的目的，以帮助对在本发明的系统和方法的实施方案中实现的本发明特定实施方案的各种方面和功能的全面和完整的理解和评价。本领域技术人员将理解，本发明可以以所描述的实施方案以外的方案实施，所描述的实施方案是为了说明而非限制的目的提供。

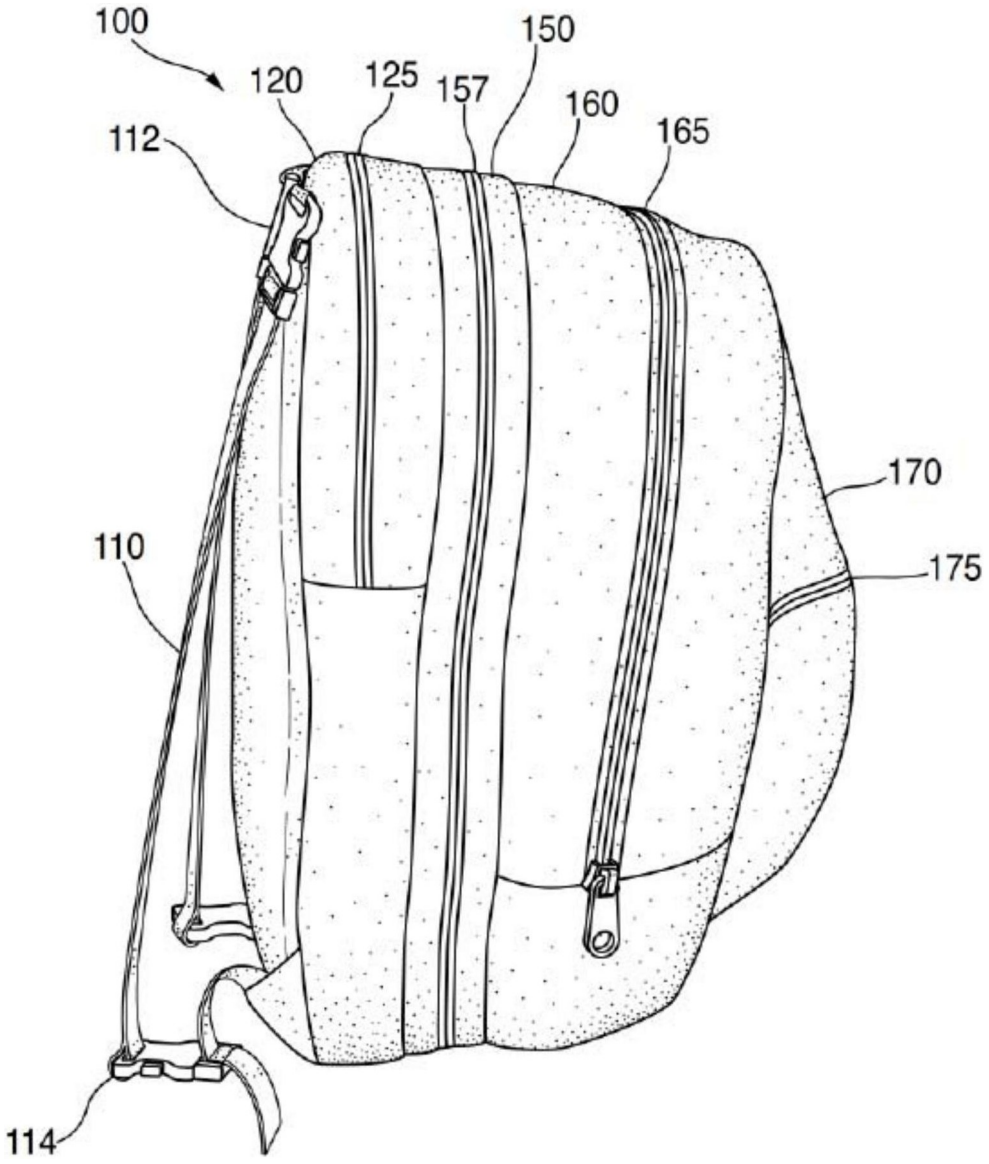


图1

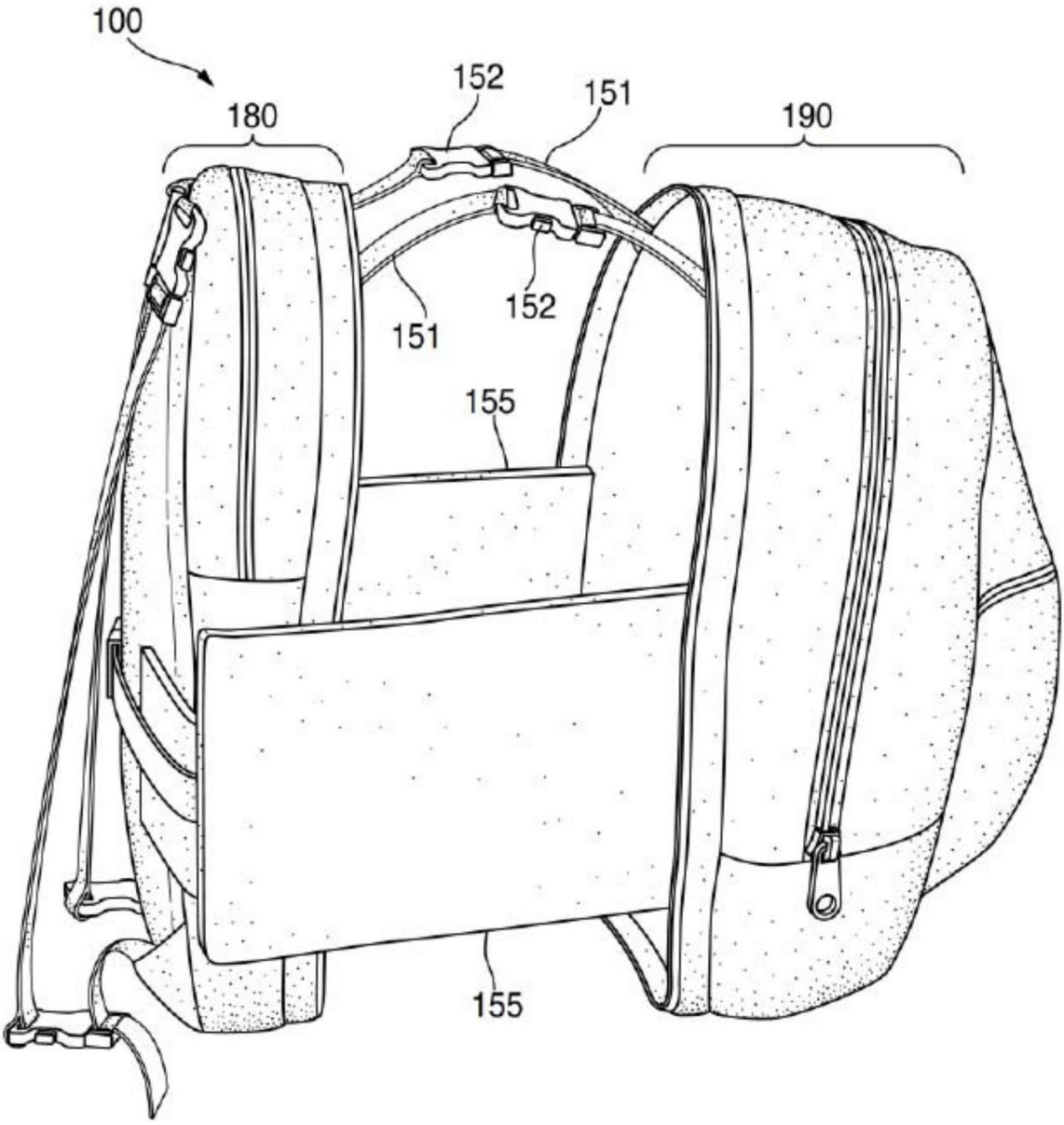


图2

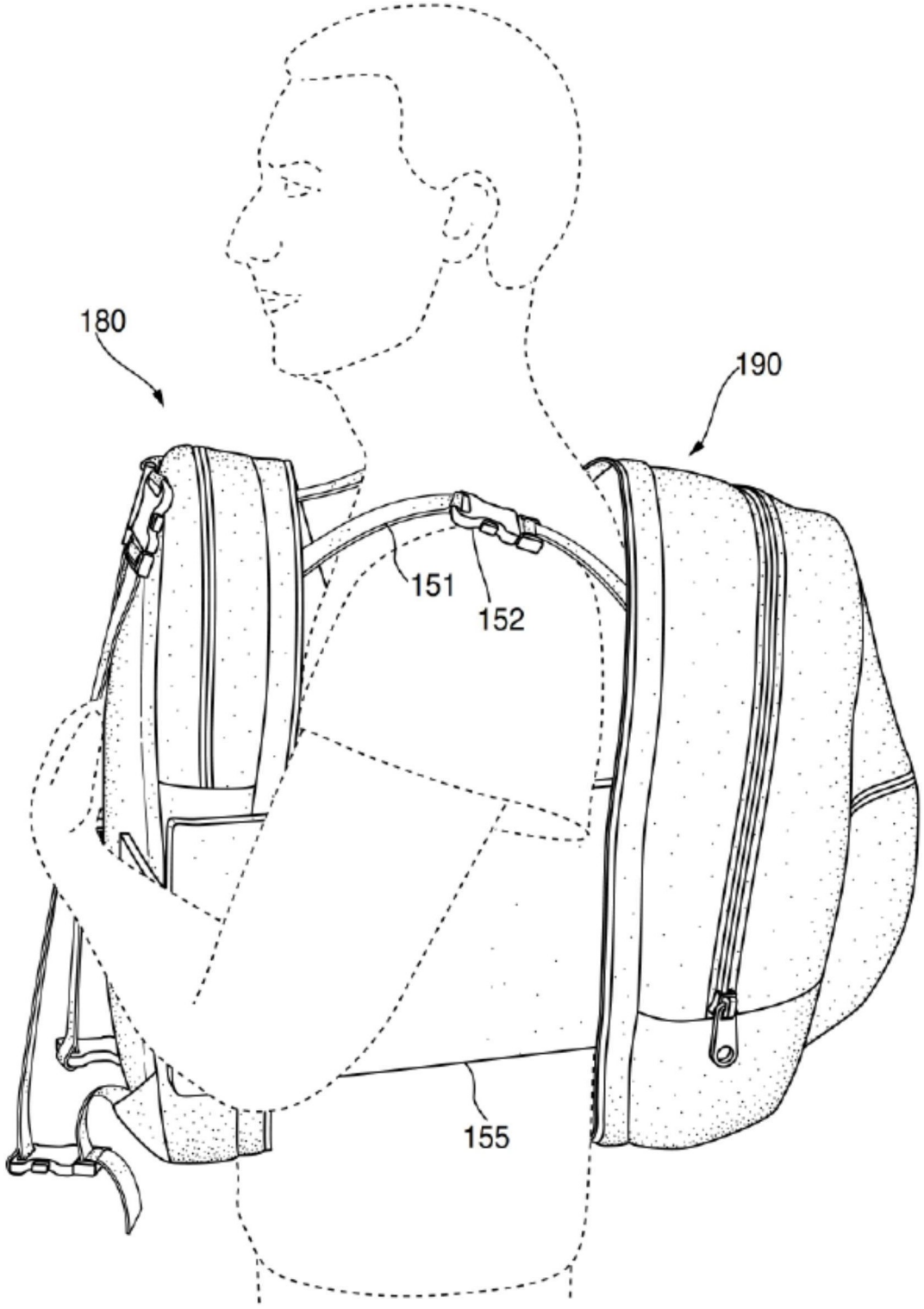


图3

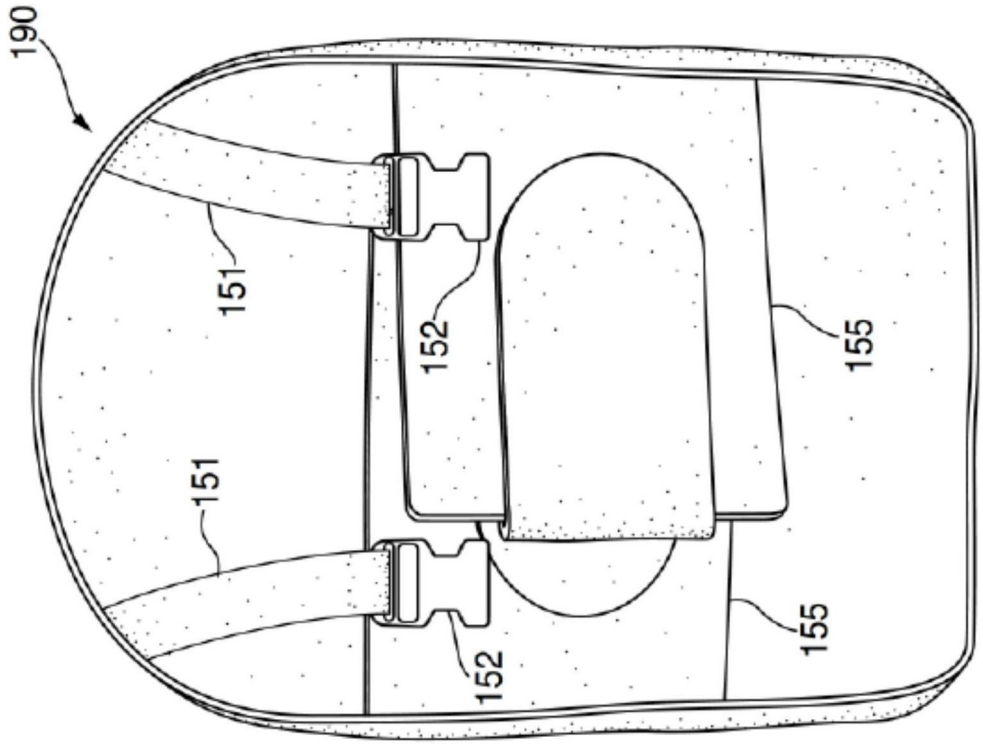


图4A

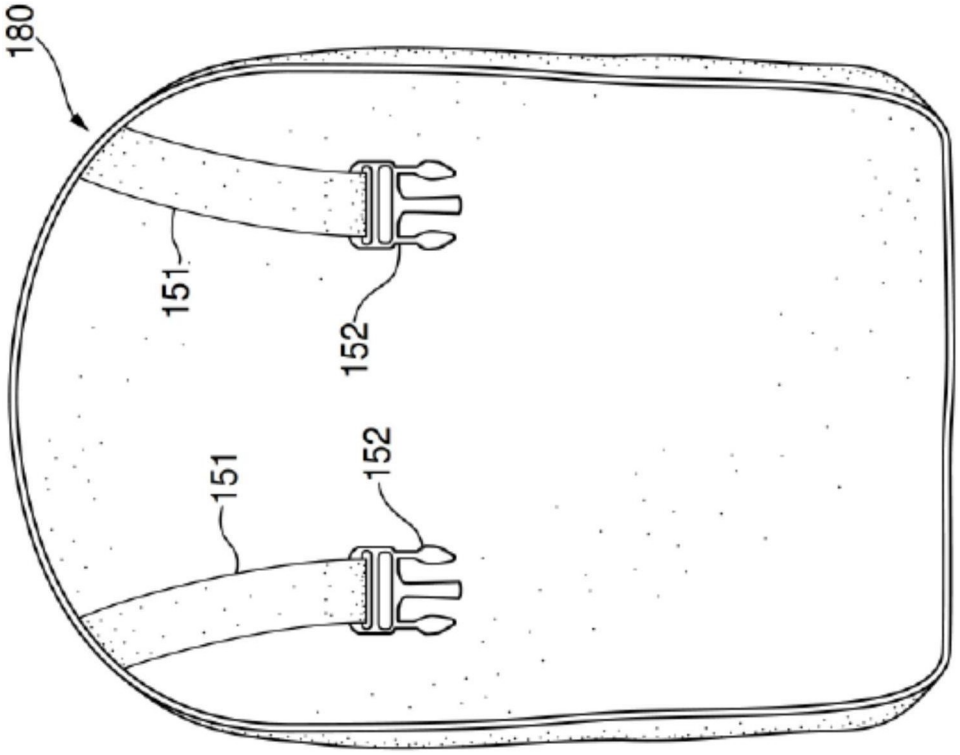


图4B

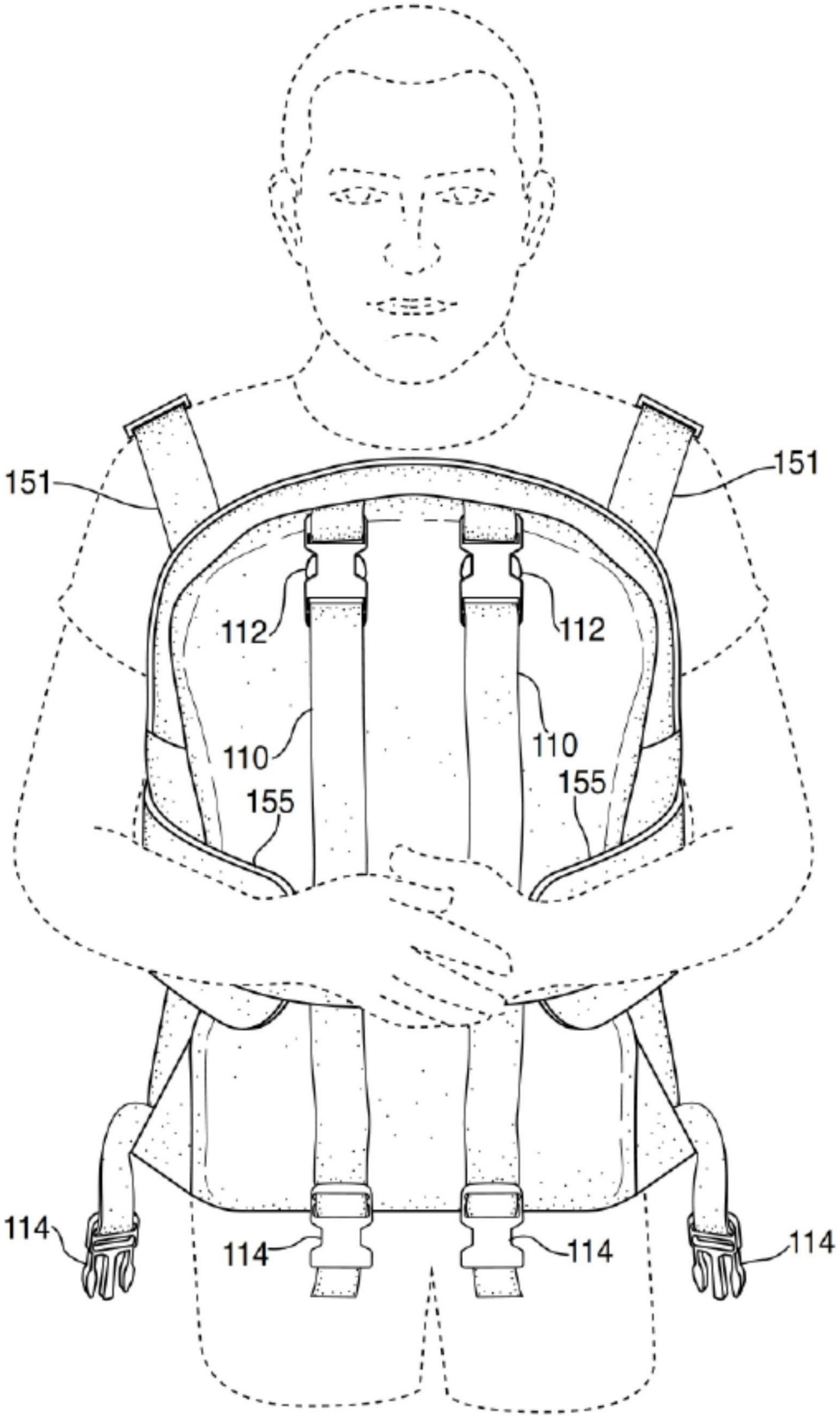


图5

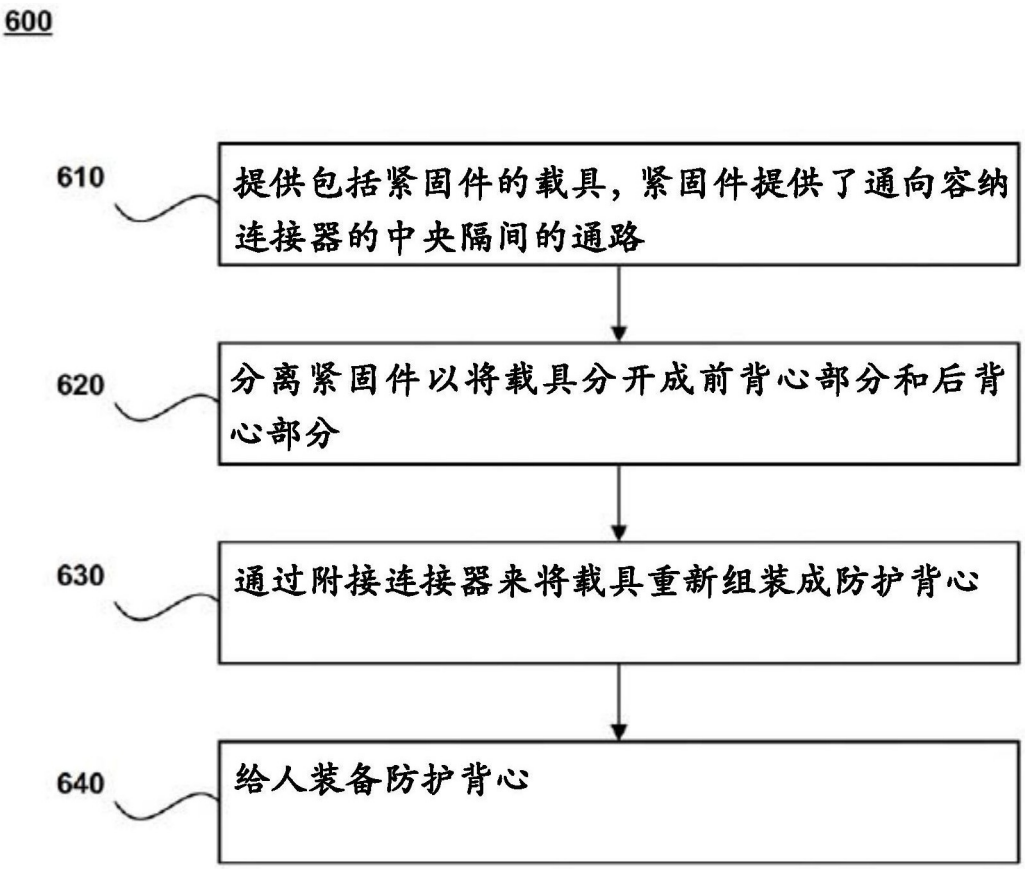

600
610
提供包括紧固件的载具，紧固件提供了通向容纳连接器的中央隔间的通路
620
分离紧固件以将载具分开成前背心部分和后背心部分
630
通过附接连接器来将载具重新组装成防护背心
640
给人装备防护背心

图6