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(54) **SUPPORT WAISTBAND WITH BODILY PROTECTIVE ELEMENTS**

(71) Applicant: **Claude Grady**, Los Angeles, CA (US)

(72) Inventor: **Claude Grady**, Los Angeles, CA (US)

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(57) **ABSTRACT**

This invention relates to support garments and personal protective gear and, more particularly, to supportive waistbands providing an adjustable belt capable of both orthopedic support and essential body armor. The invention is capable of being worn with bullet proof or protective vests without interfering with comfort or the utility of the vest. A myriad of different schemes for design, use, and placement of body armor and protective elements are disclosed.

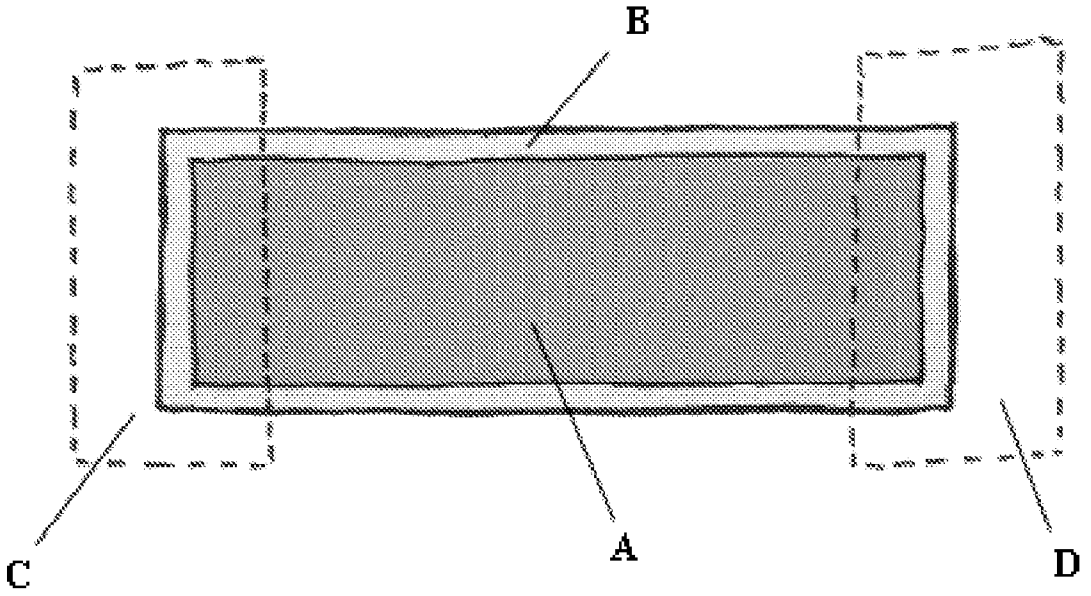


Figure 1.

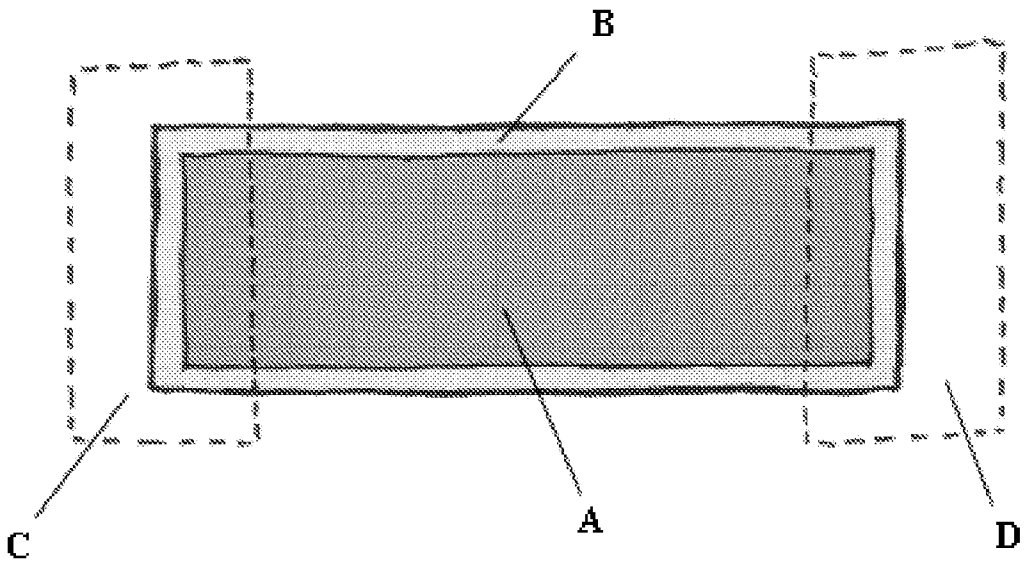


Figure 2.

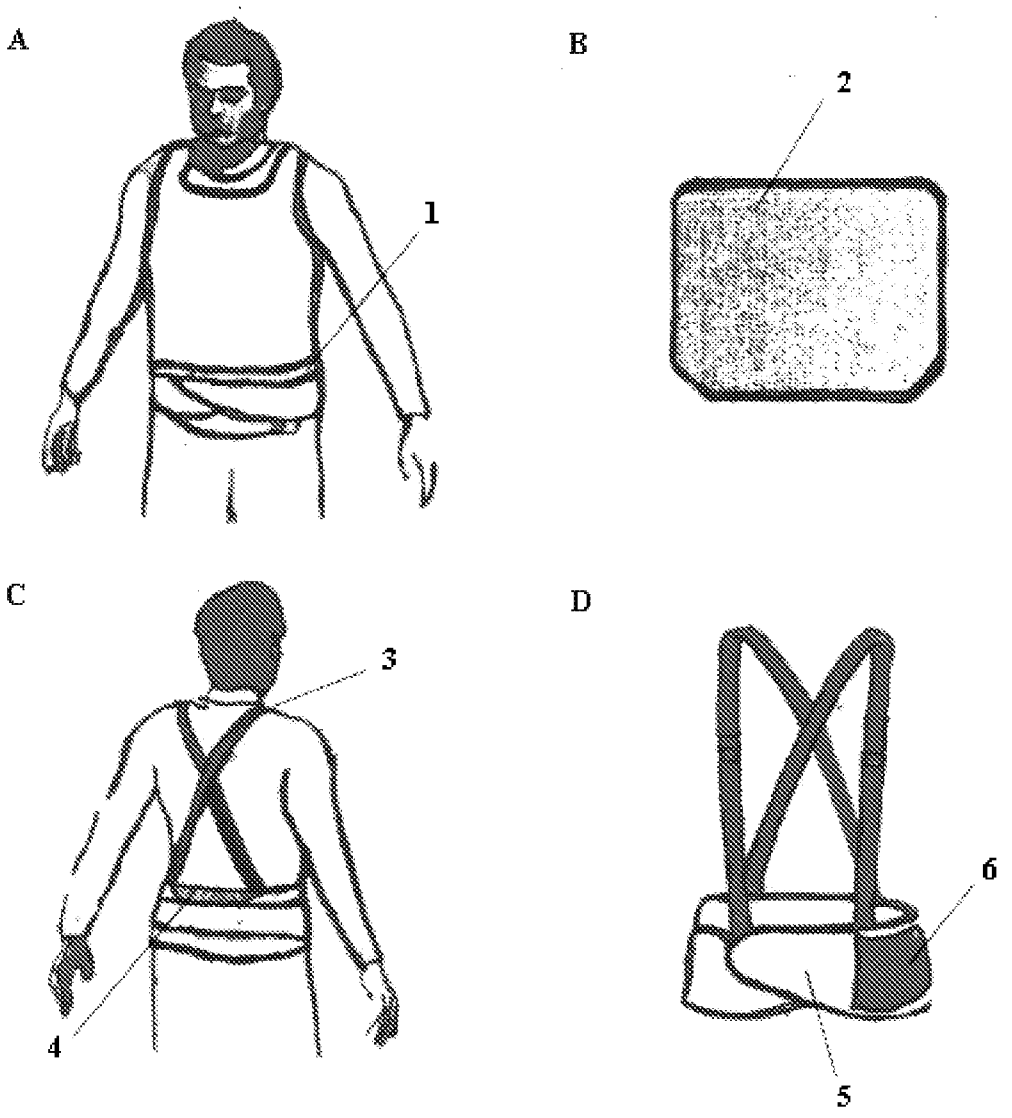


Figure 3.

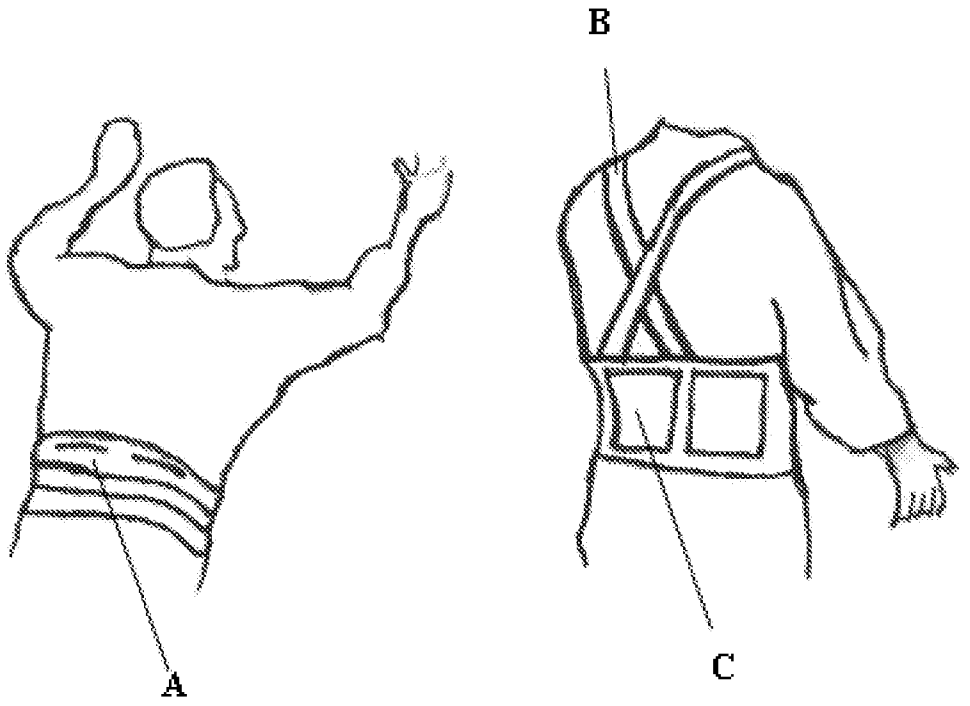


Figure 4.

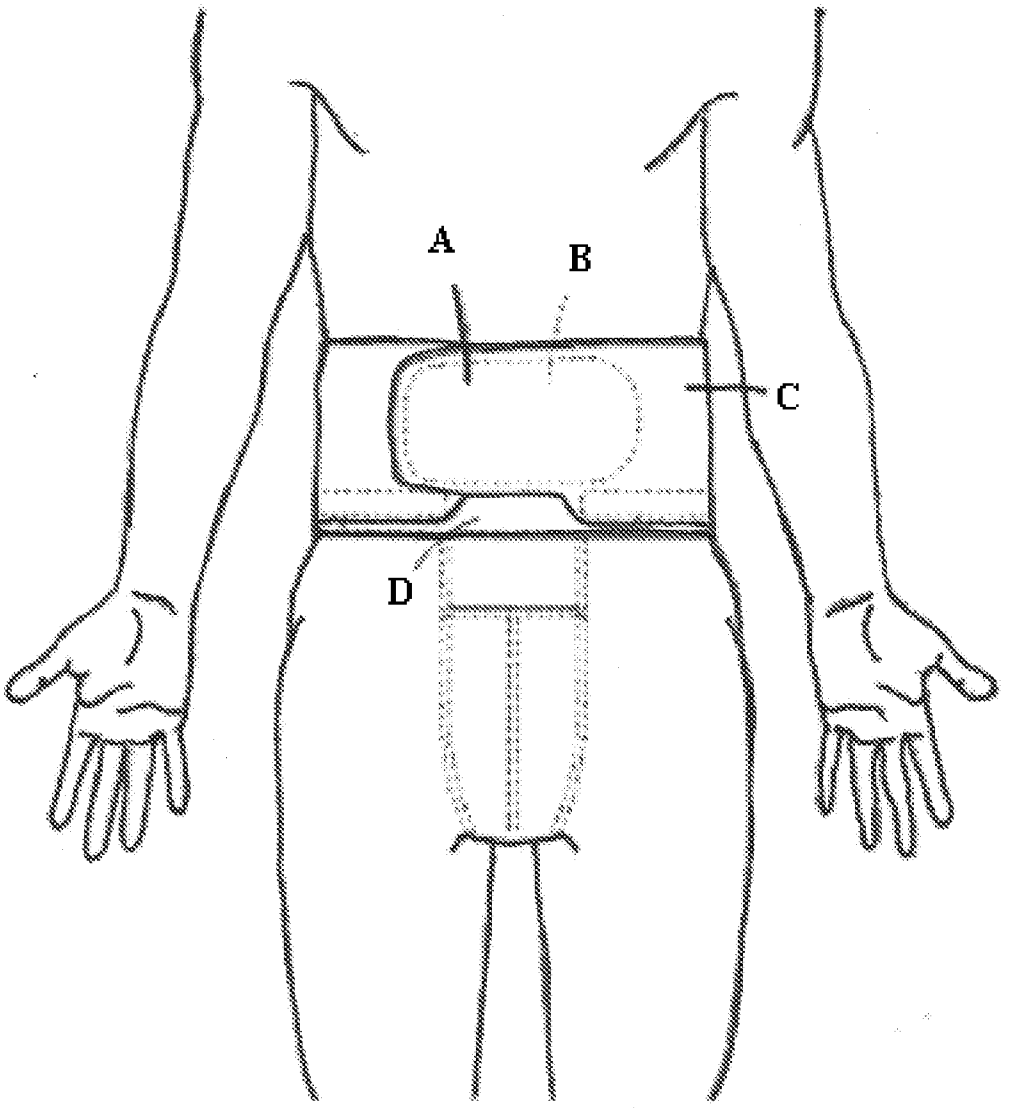


Figure 5.

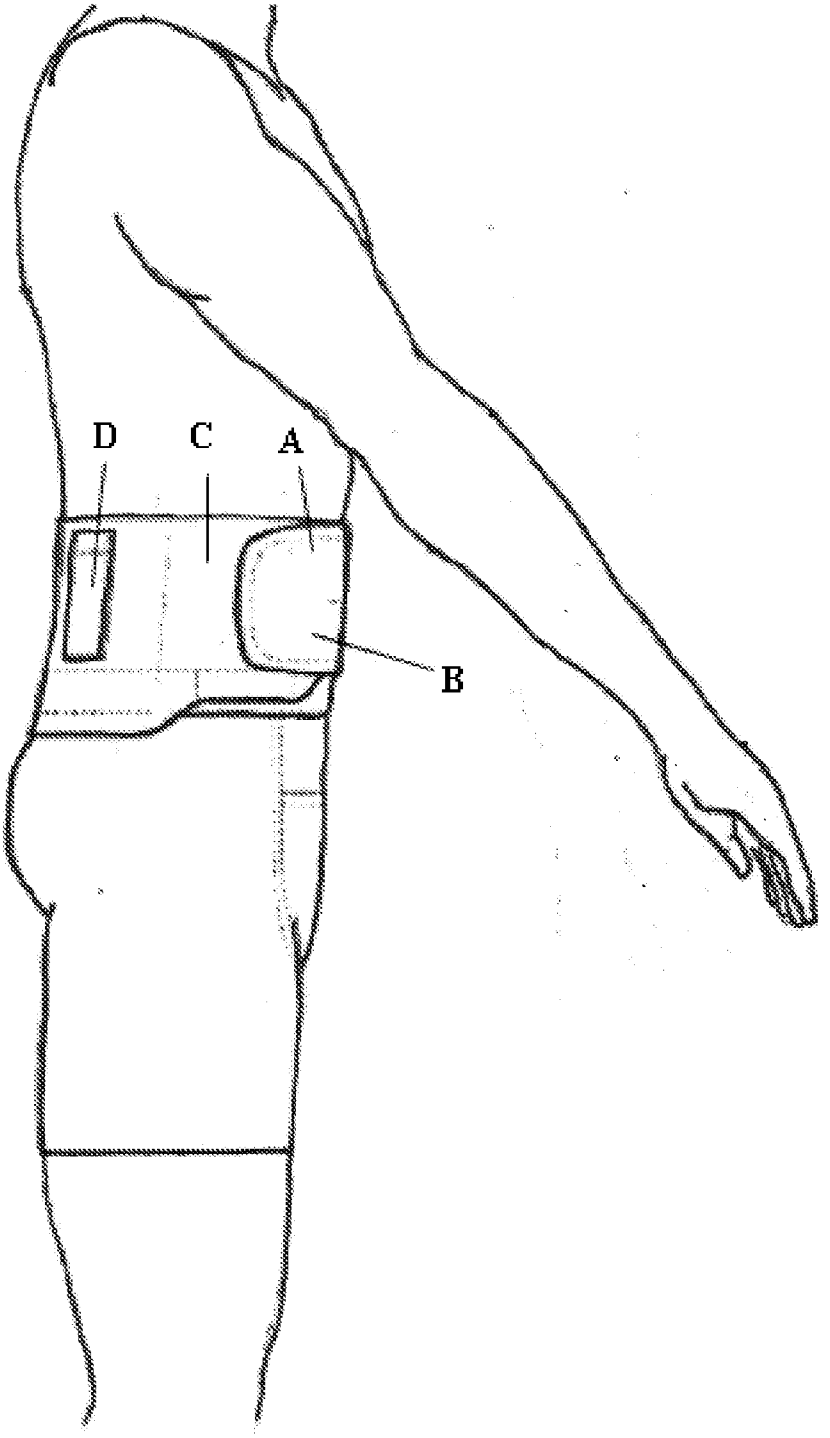


Figure 6.

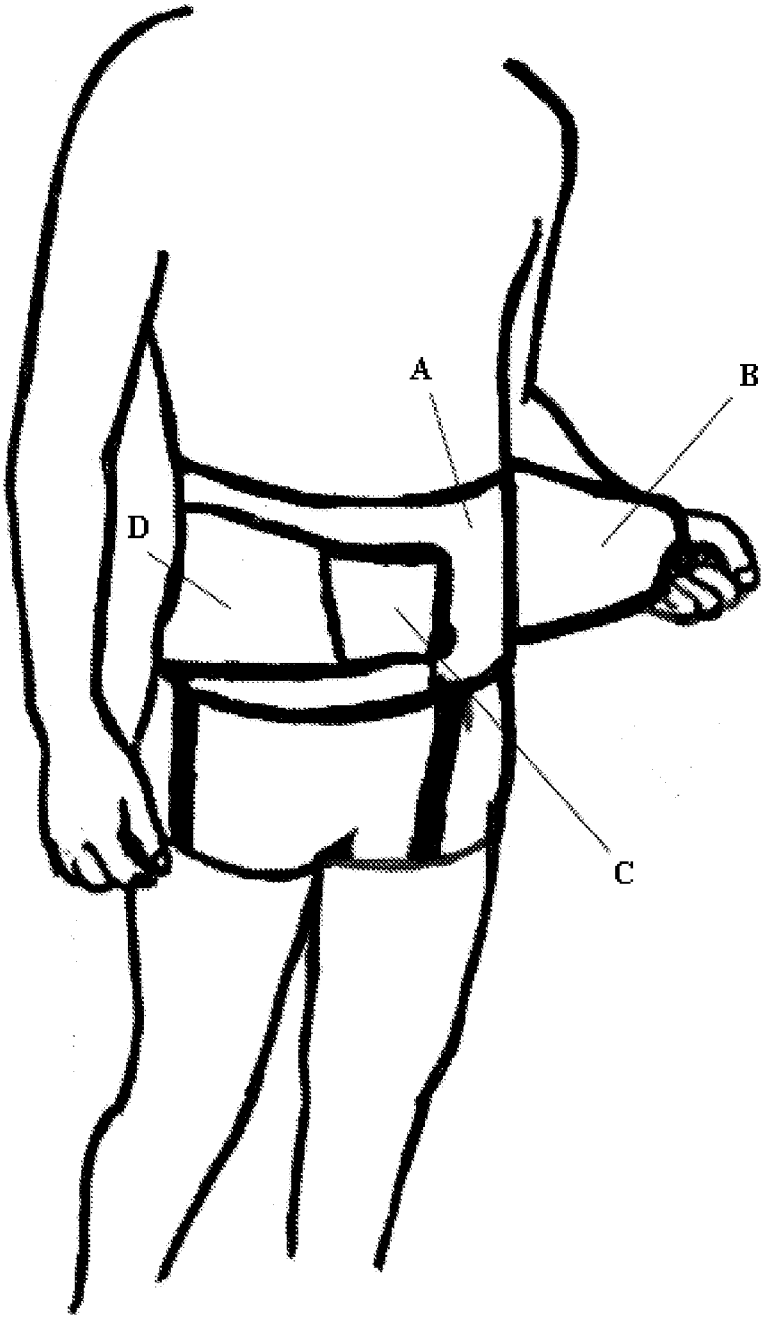
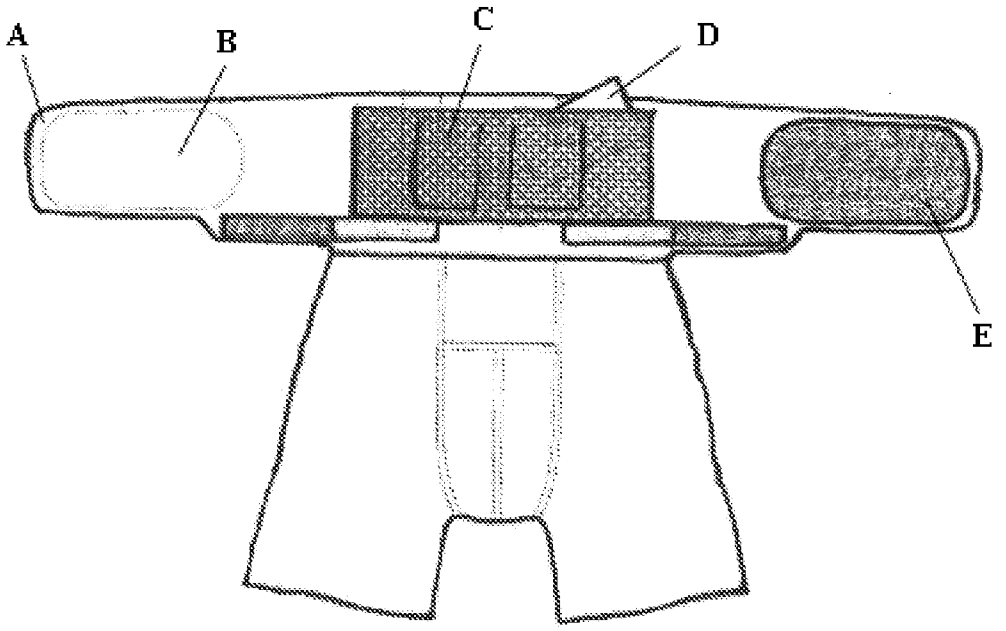


Figure 7.



SUPPORT WAISTBAND WITH BODILY PROTECTIVE ELEMENTS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of provisional application 61/630945 filed Dec. 21, 2011 and is herein incorporated by reference in it's entirety.

BACKGROUND OF THE INVENTION

[0002] Personal protective equipment is of the utmost importance in police work, the armed forces, security and other endeavors presenting substantial risk of bodily injury. According to an FBI press release by the FBI National Press Office on October 24th of 2011, 56 law enforcement officers were feloniously killed in 2010. Of those 55 were killed using firearms. A similar press release by the FBI National Press Office on Mar. 24, 2012 presents similar unfortunate statistics for 2011. Most notable to the current disclosure, law enforcement officers feloniously killed with firearms, as reported by the Criminal Justice Information Services Division (see Criminal Justice Information Services Division website under Tables for 2010, Table 38), Table 38 reports that a number of those killed had fatal wounds in the front and rear areas of the lower torso, waist area, and lower abdomen. These facts demonstrate that while Kevlar™ vests and other protective devices in the torso region are essential in the armed forces and law enforcement areas, a need still exists to protect other vulnerable areas. The waist area in particular with it's proximity to major arteries, the lower vertebrae of the spine and the spinal column, is of vital importance. Extending torso protective devices downward may offer greater shielding however presents substantial issues for mobility and comfort. Supportive waist belts have been used to provide support in occupations requiring substantial bending or lifting however offer no bodily protection from violent acts. Thus, there remains a considerable need for devices and methods that can provide support. safety, and comfort, The present invention uniquely accomplishes these tasks of greater bodily protection and greater bodily support simultaneously.

FIELD OF THE INVENTION

[0003] The disclosed invention herein generally relates to support garments and personal protective gear.

SUMMARY OF THE INVENTION

[0004] This invention relates to support garments and personal protective gear and, more particularly, the invention relates to supportive waistbands providing an adjustable belt capable of both orthopedic support and essential body armor. The invention is capable of being worn with bullet proof or protective vests without interfering with comfort or the utility of the vest. A myriad of different schemes for use and placement of body armor and protective plates are disclosed.

BRIEF DESCRIPTION OF THE FIGURES AND DRAWINGS

[0005] FIG. **1** is a basic schematic of the elements involved in e invention herein and their pproximate relationship to each other.

[0006] FIG. **2** shows various embodiments and features of the waistbelt herein. In panel A an individual is wearing a protective vest. Panel B shows an example of a thin protective plate. Panel C a shoulder harness design. Panel D is one design scheme for suspenders/shoulder harnesses attached to a waistband with a Kevlar plate.

[0007] FIG. **3** shows two more embodiments of the waistband as worn, A points to protective pocket inserts located on the back of the waistband.

[0008] FIG. **4** shows locations of various elements of the waistband in certain embodiments.

[0009] FIG. **5** shows a side view of the elements in FIG. **4**.

[0010] FIG. **6** shows basic functional areas of the waistband from the front view as a user. is putting it into place.

[0011] FIG. **7** is a schematic further indicating basic elements of the band used for securing in place and holding protective equipment.

DETAILED DESCRIPTION OF THE FIGURES AND DRAWINGS

[0012] FIG. **1** is abasic schematic of the elements involved in the invention herein and their approximate relationship to each other. In the figure the area labeled A refers to the general area whereby bodily protective elements, such as Kevlar or steel plates, may be located. As described herein in some embodiments pocket inserts would be located along this area to secure the protective gear. Areas labeled C and D within the dotted lines refer to approximate areas where fastening means may be located to secure the waistband on a user, for example velcro or buckles and others herein may be located in this area. B points to the area across the top portion of the waistband where shoulder harnesses or the like may be attached to provide additional support and stability. The figure show the general relationships encompassing most designs schemes herein, however exact locations are not to be inferred, the intent of the figure is to demonstrate a general range. Additionally the dimensions are not fixed and can provide for many embodiments, such as a waistband whereby the middle area of the waistband is wider than it's end to provide great lumbar support.

[0013] FIG. **2** shows various embodiments and features of the waistbelt herein. In panel A of FIG. **2**, the individual is wearing a protective vest, and element **1** points to the intersection of the vest and the waistband. The waistband, with or without a protective element near the upper portion of the band, is thin enough to comfortably fit under the lower portion of the protective vest. Panel B element **2** shows an example of a thin bullet padding or plate made of Kevlar which can be inserted in the waistbands specialized inserts. In panel C element **3** points to the suspenders or shoulder harness design holding the waistband up and providing further support and lower back relief. Element **4** points to how protective inserts such as Kevlar can be located on the backside of the waistband as well. Panel D one design scheme for suspenders/shoulder harnesses attached to a waistband with a Kevlar plate shown by element **6** and secured around the front by velcro patches at the point of element **5**.

[0014] FIG. **3** shows two more embodiments of the waistband as worn, A points to protective pocket inserts located on the back of the waistband. As shown the waistband may be utilized with or without an over the shoulder harness. B again points to a shoulder harness and C shows potential locations on the back side for protective plates or equipment.

[0015] FIG. **4** shows locations of various elements of the waistband in certain embodiments. A points to the outer side of one end of the band whereas B points to the inner side of the same end where the circular dotted line indicates a velcro patch. C is the main body of the band wrapped around a user and a place whereby protective gear may be located toward the sides. D shows a front location for an insert containing protective gear.

[0016] FIG. **5** shows a side view of the elements in FIG. **4**. A and B refer to the same as above as does C. D in this figure shows a pocket insert on the backside where Kevlar or the like may be located.

[0017] FIG. **6** shows basic functional areas of the waistband from the front view as a user is putting it to place. A refers to the main body of the band where protective equipment is located, B and C point to areas useful for fastening the belt by means such as velcro patches in these locations. And D shows aur area in front but toward the users side where protective equipment may be location.

[0018] FIG. **7** is a schematic further indicating basic elements of the band used for securing in place and holding protective equipment. A and B refer to the two sides of one end of the band where, in some embodiments, a velcro patch may be located. E shows the complementary patch of velcro on the opposite end. C points to one type of insert pocket located on the front of the band. D shows a protective plate being placed into another type of insert pocket on the front of the band. Elements C and D in other embodiments may placed on the back side of the belt as well.

DETAILED DESCRIPTION OF THE INVENTION

[0019] The present invention provides support garments in conjunction with personal protective gear and, discloses supportive waistbands providing an adjustable belt capable of both orthopedic support and essential body armor. The invention is capable of being worn with bullet proof or protective vests without interfering with comfort or the utility of the vest while providing lumbar back support and bodily protection in the waist and lower abdominal region. A myriad of different schemes for use and placement of body armor and protective plates within the support band are disclosed and are the object of the invention herein. In the broadest sense the invention is comprised of a band of material surrounding the waist area, means of securing the band in place around the waist, and a manner of securing protective devices along the band. FIG. **1** shows these basic elements as required in relation to each other and is described above. The figure is comprised of a band around the waist, means of attaching protective devices to the band, and means of securing the band around the waist. In most embodiments the last is accomplished by securing the two ends of the band together through velcro or other fasteners, many of which are disclosed herein, and or by securing the top or top and bottom of the band to the wearer's clothes, belt, other protective gear such as a vest, or over the shoulder or neck via a harness or suspenders. Protective devices are secured within enclosable pockets, sewn into the material of the band, or held by loops or other common fasteners as would be known to those skilled in the art.

[0020] A number of designs for a back supporting waist band that also incorporate protective equipment such as metal, ceramics, or high tensile strength fibers and others are possible. The figures give a number of embodiments by way of example, but do not represent an exhaustive list.

[0021] The embodiments herein function as a bullet proof support waistband, designed for optimal comfort, protection, and support. In certain embodiments the bullet proof support waist band is a padded adjustable lumbar support belt designed specifically for law enforcement, security, and military personnel, featuring insert pockets within the belt for the insertion of (bullet proof) body-armor padding or plates. The design intent of the bullet proof support waistband is to provide persons in highly dangerous situations with both lower back support and the protection afforded by lightweight effective body armor. Kevlar vests often lack protection for the lower back and abdominal region and leave the wearer vulnerable in these areas. With the invention herein wearers are not only shielded from gunfire, stabbing and knife wounds, shrapnel and many other potential threats, by a protective kevlar layer but they are also provided with additional lumbar support.

[0022] In one embodiment the band is a wide, contoured, adjustable fit closely woven elasticized nylon orthopedic belt. Fastening with the VELCRO closures at either end, the band in one instance measures approximately 48 inches in length by 8 inches in width and ¼ inch in thickness, and is widest at the section crossing the lower back, and equipped with a pair of adjustable over the shoulder straps. The straps are reinforced with a triple stitching for secure anchorage and support of the belt. In respect of overall appearance in this embodiment, the band presents itself as a premium-quality lumbar support belt and harness system. The band also incorporates through it's length a series of adjoining reinforced pockets into which form fitting woven Kevlar or Taron panels or ceramic, polyethylene, or steel plate Small Arms Protective Inserts (SAPI) are placed. For use with the band, the choice of the lighter more flexible Kevlar or Twaron panels or the heavier ceramic plates will depend on the caliber and type of weapon being protected against. For example, DuPonts synthetic, woven aramid fibers Kevlar and Twaron are most suitable with the waistband herein for lightweight relatively flexible protection that protects the wearer against pistol fire; for protection against rifle fire, the SAPI ceramic, polyethylene, or steel plates are employed with the band accommodating the plates in special insert pockets, and loops or stitching and other means. In certain embodiments the insert pockets of the support waist band are equipped with either nylon-zippered closures, or with VELCRO tab closures. In one embodiment the support waist band is pre-equipped with Kevlar, Twaron panels, and other suitable protective materials as would meet the needs of most law enforcement and security personnel. In other embodiments the pockets or other means of holding the protective materials are free at one opening, enclosable, or sealable such that the materials can be placed in or switched out as desired by the wearer of the belt.

[0023] The embodiments of the invention are designed to accommodate various thicknesses, levels, and weights of Small Arms Protective Inserts, such as Kevlar and Twaron, or ceramic, steel plates, and polyethylene and other materials. The overall belt system is also designed for various sizes of belts to accommodate height, waist size, and other personal fitting concerns. Exemplary embodiments not constituting an exhaustive list include X-small, for hip measurements between 24-34 inches, Regular for 32-46 inches, X-large for 42-58 inches, and XX-Large for hip sizes between 48-64 inches. The band provides the specific level of protection required by the user and with its contoured, back supporting

design and over the shoulder harness, effective in alleviating and avoidance of back strain and fatigue.

[0024] Kevlar is a registered trademark for a para-aramid synthetic fiber often used as body armor, as is Twaron. Body armor also may be metal or ceramic plates providing additional protection, for example from the heavier rifle rounds. Metallic components or tightly-woven fiber layers can give soft armor resistance to stab and slash attacks from a knife. Kevlar is well known as a component of some bullet resistant vests and bullet resistant face masks. It is also used in Emergency Service's protection gear for high heat, such as fire. The embodiments herein are not limited by any particular use commonly associated with the protective material, but include any use for which the materials are suited for. .Other appropriate materials having high tensile strength and relatively low weight as to be suitable for the designs herein may also be utilized.

[0025] The belt materials may include but are not limited to elasticized nylon, elastic, spandex, cotton, hemp, cotton derivatives, nylon fibres, polyester, polypropylene, fleece, micro-fleece, silk, flannel, denim, wool, synthetic fibers and other materials used in clothing or support garments that would be apparent to one of ordinary skill in the art.

[0026] Securing the belt or other components may be accomplished through Velcro, other fasteners such buckles, clips, buttons, hooks and others. Fasteners may be comprised of synthetic or natural fibers, plastics or metal, bronze, aluminum, or other materials typically used in making fasteners that would be known to a person of ordinary skill in the art. Velcro refers to any fabric hook and loop fastener.

[0027] Means of providing adjustability of the belt or over the shoulder harness may be a buckle, clasp, or guide, single or double buckle device, adjustable drawcord, Velcro, and other means for providing adjustability in a garments and clothing that would be obvious to a person of ordinary skill in the art.

[0028] Among other utilities the supportive waistband provides law-enforcement and private security personnel, members of the United States Armed Forces, two things that contemporary bullet proof vests do not: 1) ballistic protection for the lower back and corresponding abdominal areas, which lie below the level of standard protective vests and 2) effective lumbar support, something that will be appreciated by any man or woman who wears a heavy service belt on a daily or nightly basis.

[0029] The foregoing exemplary descriptions and the illustrative preferred embodiments of the present invention have been explained in the drawings and described in detail, with varying modification and alternative embodiment being taught. While the invention has been so shown, described and illustrated, it should be understood by those skilled in the art that equivalent changes in form and detail may be made therein without departing from the true spirit and scope of the invention, and that the scope of the present invention is to be limited only to the claims except as precluded by the prior art. Moreover, the invention as disclosed herein may be suitably practiced in the absence of the specfiic elements which are disclosed herein.

[0030] The phrase "in one embodiment" is used repeatedly. The phrase generally does not refer to the same embodiment; however, it may. The terms "comprising," "having" and "including" are synonymous, unless the context dictates otherwise. The following illustrations of various embodiments use the term "recipe" by way of example to describe the various embodiments, but this should be construed to encompass and provide for terms such as "method" and "routine" and the like.

[0031] Various aspects of the illustrative embodiments will be described using terms commonly employed by those skilled in the art to convey the substance of their work to others skilled in the art. However, it will be apparent to those skilled in the art that the embodiments described herein may be practiced with only some of the described aspects. For purposes of explanation,specific numbers, materials and configurations are set forth in order to provide a thorough understanding of the illustrative embodiments. However, it will be apparent to one skilled in the art that the embodiments described herein may be practiced without the specific details. In other instances, well-known features are omitted or simplified in order not to obscure the illustrative embodiments.

[0032] The characteristics and utilities of the present invention described in this summary and the detailed description below are not all inclusive. Many additional features and advantages will be apparent to one of ordinary skill in the art given the following description. There has thus been outlined, rather broadly, the more important features of the invention in order that the detailed description thereof that follows may be better understood, and in order that the present contribution to the art may be better appreciated.

[0033] In this respect, by explaining at least one embodiment of the invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and to the arrangements of the components set forth in the description. The invention is capable of other embodiments and of being practiced and carried out in various ways. Also, it is to be understood that the phraseology and terminology employed herein are for the purpose of description and should not be regarded as limiting.

[0034] As such, those skilled in the art will appreciate that the conception, upon which this disclosure is based, may readily be utilized as a basis for the designing of other structures, methods and systems for carrying out the several purposes of the present invention. It is important, therefore, that the description be regarded as including such equivalent constructions insofar as they do not depart from the spirit and scope of the present invention.

[0035] Further, the purpose of the foregoing abstract is to enable the U.S. Patent and Trademark Office and the public generally, and especially the scientists, engineers and practitioners in the art who are not familiar with patent or legal terms or phraseology, to determine quickly from a cursory inspection the nature and essence of the technical disclosure of the application. The abstract is neither intended to define the invention of the application, nor is it intended to be limiting as to the scope of the invention in any way. The characteristics and utilities of the present invention described in this summary and the detailed description below are not all inclusive. Many additional features and advantages will be apparent to one of ordinary skill in the art given the detailed description.

1. A supportive waistband comprising of a protective element, said protective element comprised of any of a para-aramid fiber; ceramics; or steel plates.

2. The waistband of claim **1**, wherein the protective element is secured to the waistband within pockets, loops, or stitched into the waistband material.

3. The waistband of claim **1**, wherein the protective element is secured to the waistband within pockets, and the pockets are capable of enclosing the protective element.

4. The waistband of claim **3**, wherein the waistband is secured at the waistband's ends by an area comprised of a hook and loop fastener.

5. The waistband of claim **4**, wherein the waistband is configured to be firther secured on a wearer by an over the shoulder harness.

6. An adjustable and contoured supportive waistband comprised of elasticized nylon and a hook and loop fastener at the waistband's ends, said waistband measuring approximately 48 inches in length by 8 inches in width and ¼ inch in thickness.

7. The waistband of claim **6**, wherein the waistband is widest at the section configured to cross the lower back.

8. The waistband of claim **7**, wherein the waistband is connected to an adjustable over the shoulder strap.

9. The waistband of claim **6**, further comprising of at least one enclosure housing either para-aramid fiber, ceramics, or polyethylene.

10. The waistband of claim **1**, wherein the protective element is secured to the waistband within a series of adjoining reinforced pockets incorporated through the waistband's length.

11. The waistband of claim **6**, further comprising a series of adjoining reinforced pockets incorporated throughout the waistband's length.

12. An adjustable and contoured supportive waistband comprised of elasticized nylon and hook and loop fasteners at the ends of the waistband, said waistband. measuring between 12 and 82 inches in length, between 4 and 20 inches in width, and between one tenth of 1 inch and 1 inch in thickness.

13. The waistband of claim **12**, further comprising a series of adjoining reinforced pockets incorporated throughout the waistband's length.

14. The waistband of claim **12**, wherein said pockets house any of para-aramid fiber, ceramics, or polyethylene.

15. The waistband of claim **6**, wherein said pockets house any of para-aramid fiber, ceramics, or polyethylene.

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