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(54) **ELECTRICALLY CONDUCTIVE PROTECTIVE GARMENT ENSEMBLE TO PROTECT AGAINST ELECTRIC STUN DEVICE MISUSE**

(52) **U.S. Cl.**
USPC 2/463

(57) **ABSTRACT**

An electrically conductive protective garment ensemble worn as an electric stun device misuse countermeasure comprising a variety of clothing articles made from metal coated fabrics with each individual clothing article selectively fastened to another in a manner as to ensure electrical continuity throughout the garment ensemble and to an electrical ground. An electric stun device will be effectively short circuited to itself and/or to an electrical ground when the stun voltage is applied to the garment ensemble and be rendered inoperable. The electrically conductive protective garment ensemble is lightweight, does not decrease mobility, readily concealable, can be covered with other fabrics, used as a clothing liner and is easily manufactured

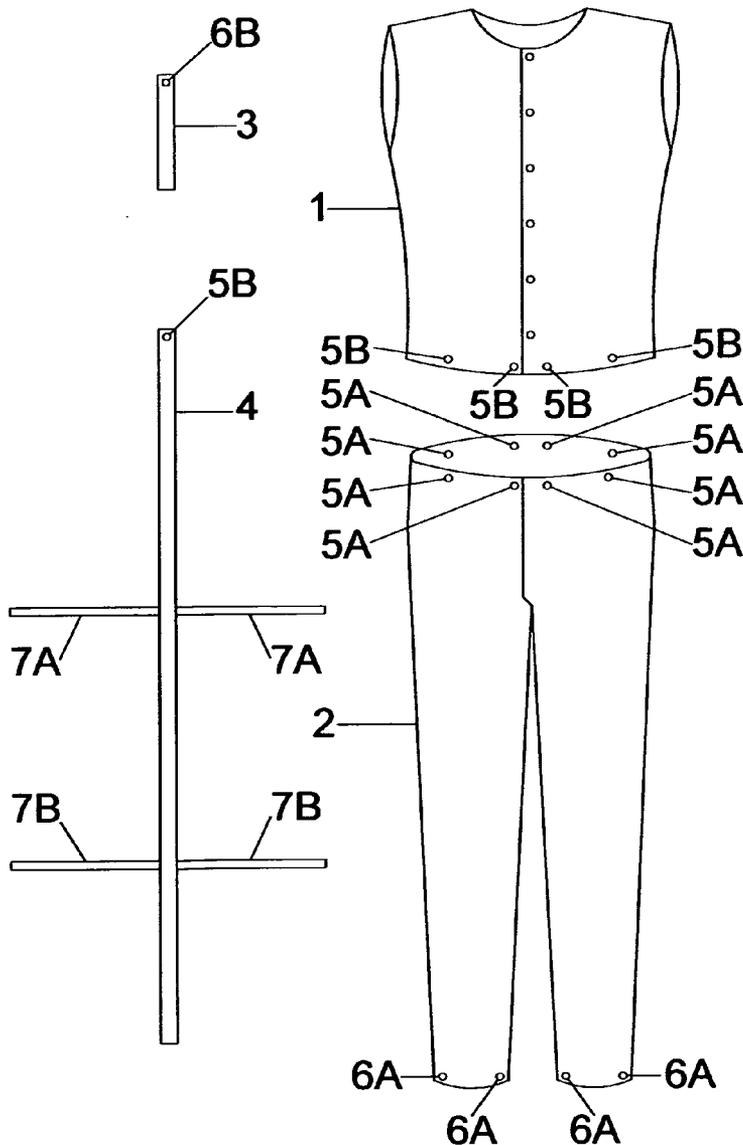
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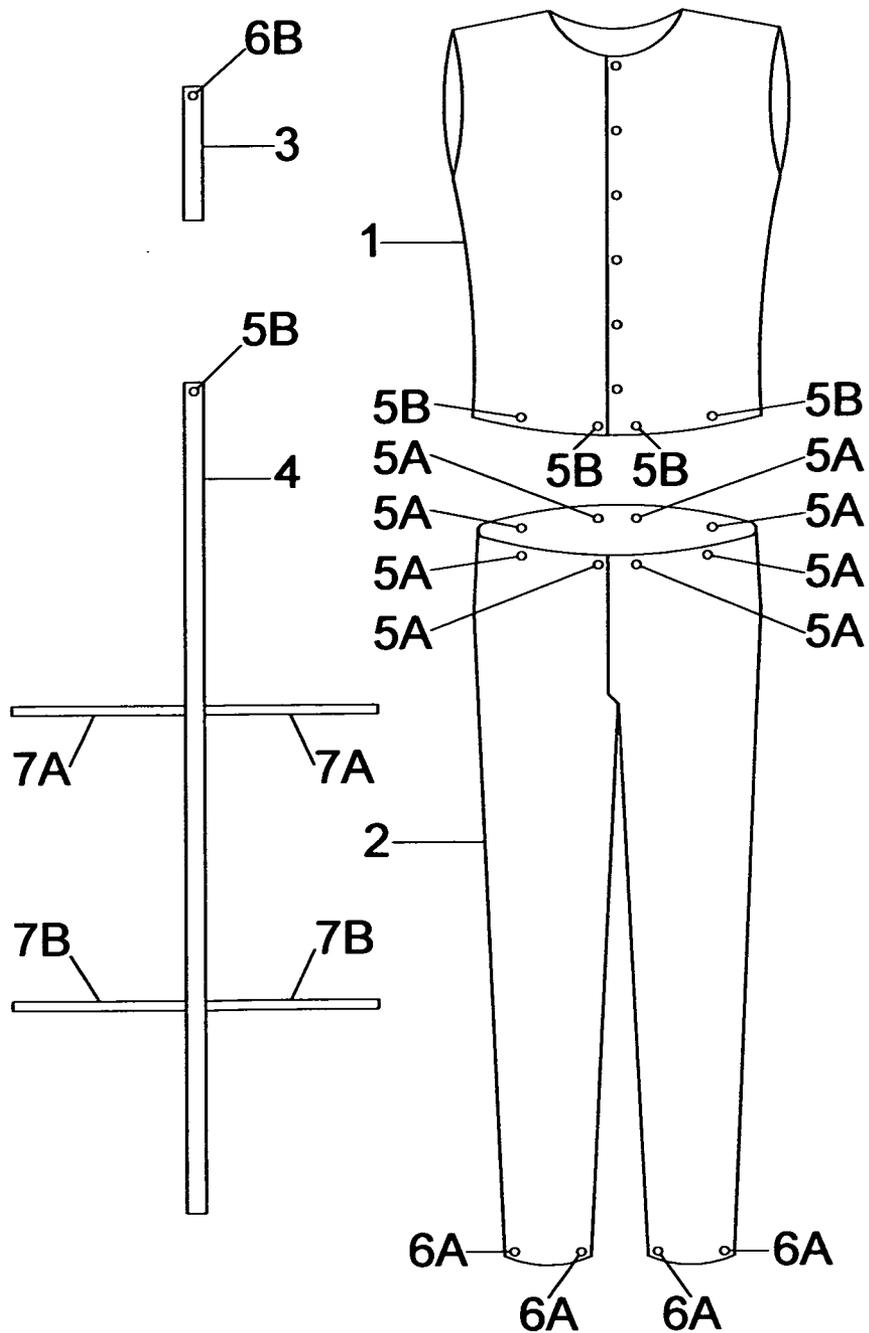


FIG. 1

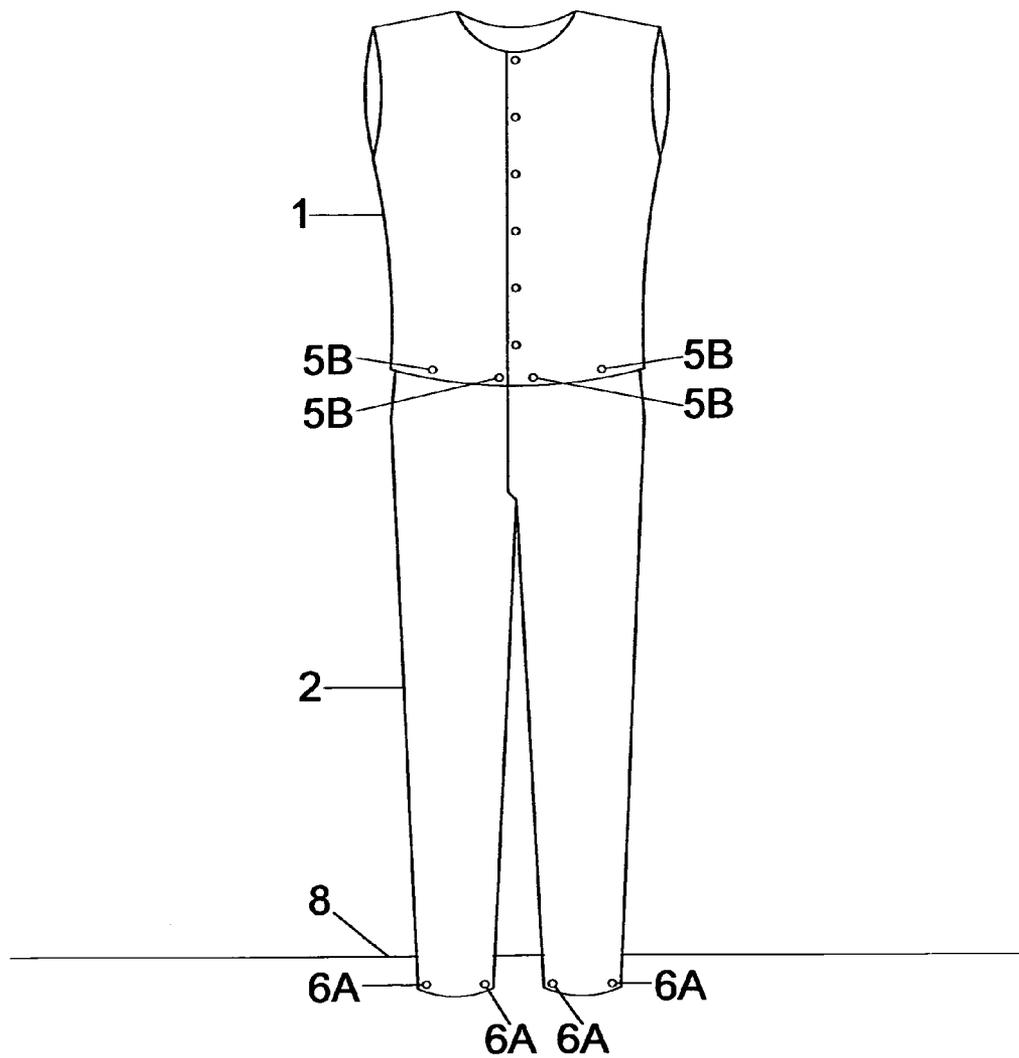


FIG. 2

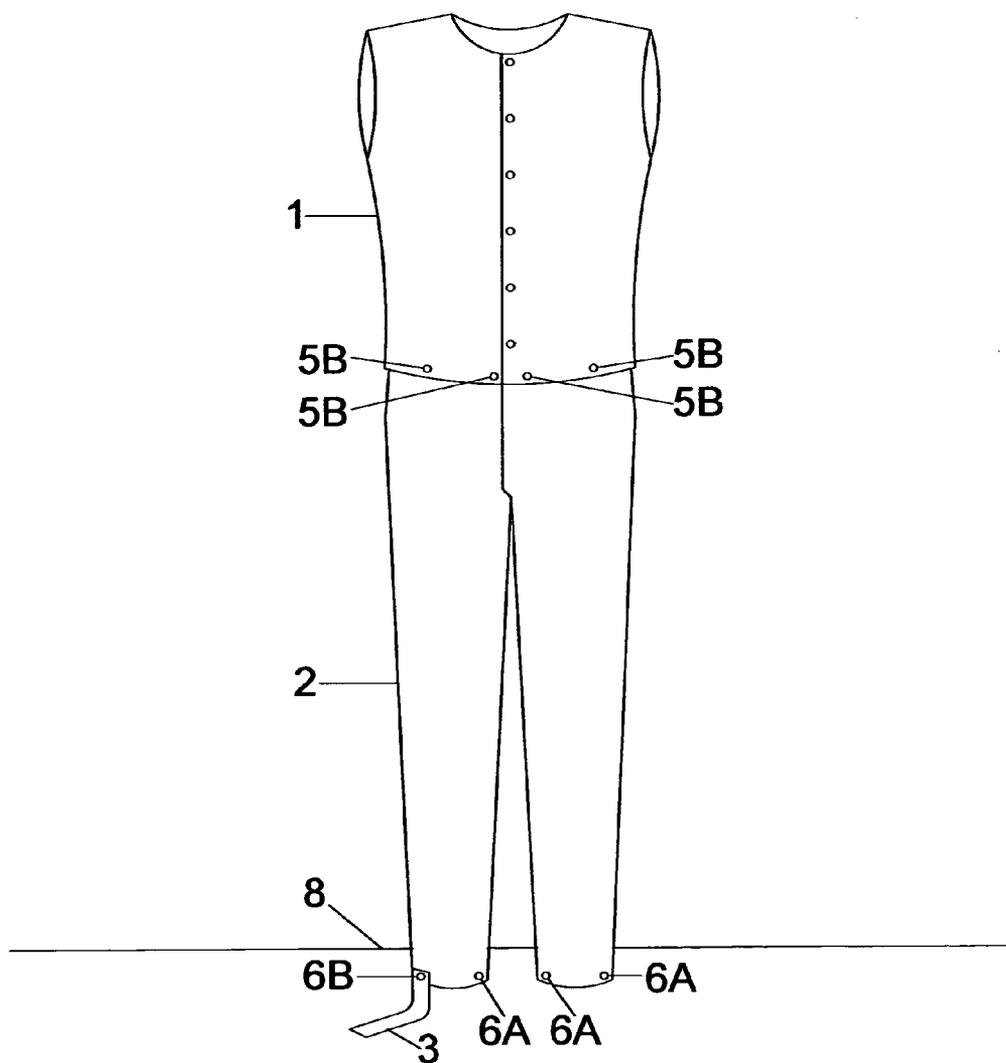


FIG. 3

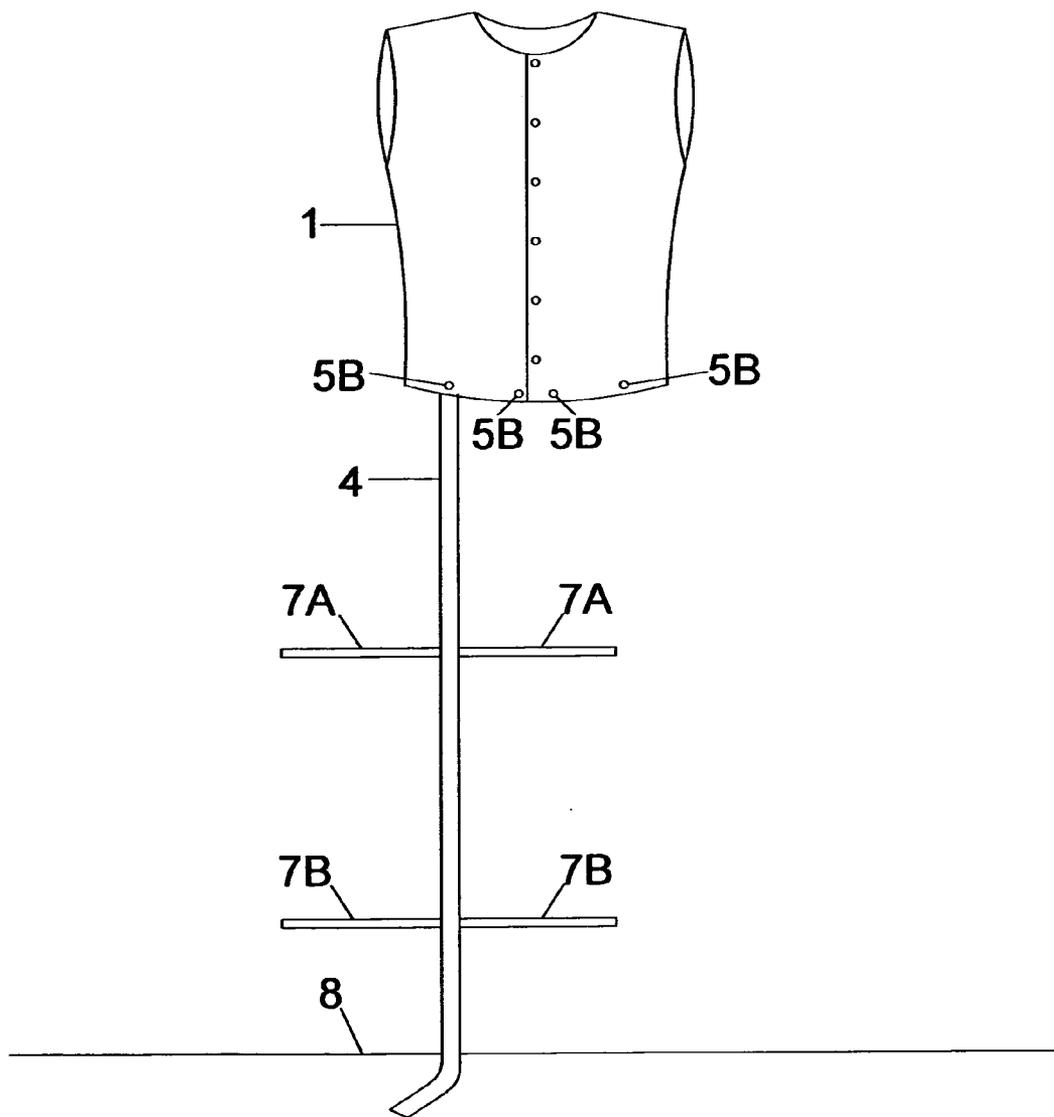


FIG. 4

ELECTRICALLY CONDUCTIVE PROTECTIVE GARMENT ENSEMBLE TO PROTECT AGAINST ELECTRIC STUN DEVICE MISUSE

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] Provisional application No. 61/465,553, entitled "ELECTRICALLY CONDUCTIVE APRON AND ACCESSORY TO PROTECT AGAINST ELECTRIC STUN DEVICE MISUSE" filed on Mar. 21, 2011 by John L. Kotos.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] Not Applicable

REFERENCE TO SEQUENCE LISTING, A TABLE, OR A COMPUTER PROGRAM LISTING COMPACT DISK APPENDIX

[0003] Not Applicable

BACKGROUND OF THE INVENTION

[0004] The present invention relates to protective garments and, more particularly, to an electrically conductive protective garment ensemble having multiple articles that protects the user by disrupting the effectiveness and functionality of electric stun devices used in criminal and terrorist activities which can be worn separately or in combinations as the user deems necessary.

[0005] Electric stun devices have evolved with several methods for the delivery of a high voltage discharge to an intended target. Some of these methods include direct contact probes on the enclosure of the hand-held power supply for a direct contact method. Another method employs an auxiliary source propelled projectile with all elements of the power supply contained within the projectile. Yet another method utilizes electrically conductive liquids forcibly expelled from the hand-held power supply to deliver an immobilizing electric charge to a target. The most current and commercially available delivery system is that of dual compressed air propelled projectiles as the high voltage electrodes with attached wires to the hand-held power supply. The leading end of each electrode-projectile is fitted with a barbed wire to penetrate the surface of, and secure itself to a target. This two tethered electrode-projectile method is the system incorporated in the TAZER® device. With the announcement that TAZER® devices are now available to the general public, the need for suitable countermeasures in the form of protective garments and accessories to be made available stems from the same reasons why TAZER® devices and other electric stun devices were originally developed. These reasons generally amount to the circumvention of criminal activity and to subdue the criminal. The following U.S. patents disclose electric stun devices and the method of electric charge delivery of each are cited. U.S. Pat. No. 3,523,538 entitled "ARREST DEVICE" issued on Aug. 11, 1970 to Kunio Shimizu discloses a delivery system that incorporates a single compressed air propelled projectile with two embedded electrodes and attached wires to the hand-held power supply. U.S. Pat. No. 3,803,463 entitled "WEAPON FOR IMMOBILIZATION AND CAPTURE" issued on Apr. 9, 1974 to John H. Cover and U.S. Pat. No. 4,253,538 entitled "POWER SUPPLY FOR WEAPON FOR IMMOBILIZATION AND CAPTURE" issued on Feb.

24, 1981 to John H. Cover each disclose delivery systems each using one or two electrode-projectiles or a net tethered with a sufficient number separate wires to the hand-held power supply. U.S. Pat. No. 4,688,140 entitled "ELECTRONIC DEFENSIVE WEAPON" issued on Aug. 18, 1987 to John Hammes discloses a delivery system that employs the direct contact method previously described. U.S. Pat. No. 5,103,366 entitled "ELECTRICAL STUN GUNS AND ELECTRICALLY CONDUCTIVE LIQUIDS" issued Apr. 7, 1992 to Gregory Battochi discloses a delivery system that dispenses charged electrically conductive liquids from the hand-held power supply. U.S. Pat. No. 5,473,501 entitled "LONG RANGE ELECTRICAL STUN GUN" issued on Dec. 5, 1995 to James P. Claypool discloses a delivery system which uses a wire-less projectile with self-contained electronics to convert a received laser beam into a stun voltage. U.S. Pat. No. 5,654,867 entitled "IMMOBILIZATION WEAPON" issued on Aug. 5, 1997 to John H. Murray discloses a dual delivery system with the choice of the direct contact method or the two tethered electrode-projectile method. U.S. Pat. No. 5,831,199 entitled "WEAPON FOR IMMOBILIZATION AND CAPTURE" issued on Nov. 3, 1998 to James McNulty Jr. et al discloses a delivery system that employs a modified two tethered electrode-projectile method. U.S. Pat. No. 5,962,806 entitled "NON-LETHAL PROJECTILE FOR DELIVERING AN ELECTRIC SHOCK TO A LIVING TARGET" issued Oct. 5, 1999 to Peter G. Coakley et al discloses a delivery system that employs an auxiliary source propelled projectile with all elements of the power supply contained within the projectile. U.S. Pat. No. 6,575,073 entitled "METHOD AND APPARATUS FOR IMPLEMENTING A TWO PROJECTILE ELECTRICAL DISCHARGE WEAPON" issued Jun. 10, 2003 to James McNulty Jr. et al discloses the use of a modified two electrode-projectile delivery system. U.S. Pat. No. 6,636,412 B2 entitled "HAND-HELD STUN GUN FOR INCAPACITATING A HUMAN TARGET" issued on Oct. 21, 2003 to Patrick W. Smith discloses a delivery system that employs the two tethered electrode-projectile method. In addition to the reasons for the need of such devices stated in the aforementioned patents, the increasing activity of international terrorists and the increased accessibility to stun devices present a potentially serious problem to law enforcement agencies as well as to the general public. It is also noted that the alleged misuse of such devices by law enforcement officers and security guards have been reported by the news media on numerous occasions.

[0006] All of the electric stun devices disclosed in the aforementioned patents incorporate some form of electric and/or electronic circuitry which, if short-circuited, will disable the device by reducing the high voltage charge to a low or zero voltage. If these electric stun devices are operated with a short-circuit condition for a prolonged period of time, it is most likely that the electrical and/or electronic circuitry would be damaged and render the device useless until it is completely disassembled and repaired. Various puncture resistant garments, which are electrically conductive, are generally rigid shields worn external of clothing and are constructed of bulky, inflexible metals such as titanium or other extremely hard metal alloys. A more detailed analysis of these metallic vests and garments can be found in U.S. Pat. No. 6,131,193 entitled "COMBINED PUNCTURE RESISTANT AND BALLISTIC RESISTANT PROTECTIVE GARMENT" issued Oct. 17, 2000 to Thomas E. Bachner Jr. The

disadvantages of the garments described in the "Background of the Invention" of U.S. Pat. No. 6,131,193 are due to the bulk and rigidity of such externally worn metallic vests. The primary disadvantages are that they are uncomfortable to wear, decrease mobility, cause fatigue and are not readily concealable.

BRIEF SUMMARY OF THE INVENTION

[0007] One object of the present invention is to provide an electrically conductive protective garment ensemble which protects the user against the misuse of the multitude of available electric stun devices by short circuiting the high voltage probes and/or the electrode-projectiles of the electric stun device power supply across each other, causing the effects of the electric stun device to be negligible. It is another object of the present invention to provide an electrically conductive protective garment ensemble which protects the user against the aforementioned misuse by providing an alternate circuit path for directing the stun current to an appropriate electrical ground, thus causing the effects of the electric stun device to be negligible. It is yet another object of the present invention to provide an electrically conductive protective garment ensemble in a variety of articles that include jeans, jerseys, long-sleeve shirts, pants, short-sleeve shirts, sleeveless shirts, sweaters, vests and trousers. It is still yet another object of the present invention that articles of the electrically conductive protective garment ensemble are flexible as not to decrease the mobility of the wearer. It is still a further object of the present invention that articles of the electrically conductive protective garment ensemble are readily concealable while worn. It is yet still another object of the present invention that articles of the electrically conductive protective garment ensemble are inconspicuous and unobvious in appearance, therefore concealment of articles of the electrically conductive protective garment ensemble is not necessary, but an option. Other objects, features and advantages of the present invention in its details of fabrication and arrangement of materials will be seen from the following detailed description of several embodiments of the present invention when considered with the drawings and from the appended claims.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

[0008] FIG. 1 is a group of illustrations representative of articles comprising an electrically conductive protective garment ensemble of the present invention;

[0009] FIG. 2 is a view of a first embodiment of the present invention as a combination of selected articles from the electrically conductive protective garment ensemble;

[0010] FIG. 3 is a view of a second embodiment of the present invention as another combination of selected articles from the electrically conductive protective garment ensemble;

[0011] FIG. 4 is a view of a third embodiment of the present invention as another combination of selected articles from the electrically conductive protective garment ensemble.

DETAILED DESCRIPTION OF THE INVENTION

[0012] The electrically conductive protective garment ensemble of the present invention has the primary function of providing an effective protection against the debilitating effects of electric stun devices. The present invention accomplishes this in either one of two ways. The first way is by

providing an electrical short circuit current path between the two probes of an electric stun device using the direct contact method when in contact with the present invention or between the two electrode-projectiles of an electric stun device using the two tethered electrode-projectile method when in contact with the present invention. The short circuit current path will redirect the electric stun current away from the present invention user's body, effectively nullifying the debilitating effects of the electric stun device. If the electric stun device is operated with both probes or both electrode-projectiles in contact with the present invention for a significant period of time, the electric stun device may be damaged and become inoperable. The second way is by providing an electrical short circuit current path between one electrode-projectile of a two tethered electrode-projectile electric stun device and to a floor that is a good electrical ground. The second way is necessary only if any portion of the present invention user's body is in contact with an electrical ground and the other electrode-projectile is not in contact with the present invention or any other unprotected part of the present invention user's body. The surface of the Earth, or a metal surface grounded to the Earth are suitable floors. Floors made of asphalt, concrete, tiling, wood or any other insulating material cannot be electrically grounded. When only one electrode-projectile is in contact with a person's body, a floor on which the person is standing is not a good electrical ground and no part of the person's body is in contact with an electrical ground, the electric stun device will have a negligible effect on a person whether the person is wearing or not wearing the present invention. If one probe of the direct contact method makes contact with the present invention and the other probe makes contact with an unprotected part of the present invention user's body, the protective properties of the present invention will be neutralized. If one electrode-projectile of the two tethered electrode-projectile method makes contact with the present invention and the other electrode-projectile makes contact with an unprotected part of the present invention user's body, the protective properties of the present invention will be neutralized.

[0013] Referring now to the drawings in general, the illustrations are for the purpose of describing the present invention and are not intended to limit the invention thereto. All drawings are of an approximate proportion and approximate scale.

[0014] Referring to FIG. 1, in accordance with the present invention, articles of the electrically conductive protective garment ensemble are illustrated. The articles illustrated are a upper torso garment (1), a lower torso garment (2), and a short ground strap (3) and a long ground strap (4). Herein, all references to the upper torso garment (1) are to be broadly construed to refer to a coat, jacket, jersey, long sleeve shirt, poncho, pullover, short sleeve shirt, sleeveless shirt, sweater, vest, etc. Herein, all references to the lower torso garment (2) are to be broadly construed to refer to jeans, pants, trousers etc., that covers the entire length of the legs. Each individual article of the present invention comprises at least one layer of a metal coated fabric. Metal coated fabrics are readily available from companies such as Swift Textile Metalizing LLC of Bloomfield, Conn. The base fabrics offered by such companies include continuous loop, knit, nonwoven point bonded, rip stop, and the like which are well known to those skilled in the art. The metal coatings that are commonly available are nickel and/or silver however, other metal coatings that include copper and/or gold are available. The electrical resistance of these metal coated fabrics range from 0.1 ohm per

square inch of metal coated fabric to 2.0 ohm per square inch of metal coated fabric for the samples reviewed. The ohm per square inch of metal coated fabric standard of measurement is derived from measuring the electrical resistance across two opposite sides of a one inch square piece of metal coated fabric. Use of an ohmmeter for measuring electrical resistance is well known to those skilled in the art. A nonwoven point bonded fabric coated with nickel/silver with an electrical resistance of 0.1 ohm per square inch of metal coated fabric was selected for the first prototype of the present invention. When articles of the present invention are comprised of at least two layers of metal coated fabric, the layers are joined together at the edges of each article in a manner such that adjacent layers of the metal coated fabric are free to move relative to each other. Each article of the electrically conductive protective garment ensemble can be sewn or adhesively bonded into desired patterns or the like. Such techniques are well known to those skilled in the art. Electrical continuity throughout each article must be established and can be confirmed using an ohmmeter. Articles of the present invention are selectively attached to or removed from an appropriate article of the present invention by any well known fasteners that include buttons, hook and eye type, hook and loop type, pins, snaps, zippers and the like. The attachment is such that there is a good electrical connection between all fastened articles. In more detail, still referring to the invention of FIG. 1, a metal snap fastener half (5A) is shown at a plurality of locations on the lower torso garment (2) and at a single location on the long ground strap (4). A metal snap fastener half (5B) is shown at a plurality of locations on the upper torso garment (1). Each metal snap fastener half (5A) mates with a corresponding metal fastener half (5B) and serve as a means of attaching the upper torso garment (1) and the lower torso garment (2). A good electrical connection between the upper torso garment (1) and the lower torso garment (2) is also established. A metal snap fastener (5A) is shown at a single location on the long ground strap (4) as a means of attachment to one of the metal snap fastener half (5B) locations on the upper torso garment (1). A good electrical connection is also established between the upper torso garment (1) and the long ground strap (4). A metal snap fastener half (6A) is shown at a plurality of locations on the lower torso garment (2). A metal snap fastener (6B) is shown at a single location on the short ground strap (3). Each metal snap fastener half (6A) mates with the metal snap fastener half (6B) as a means of attaching the short ground strap (3) to the lower torso garment (2). A good electrical connection is established between the lower torso garment (2) and the short ground strap (3). The metal snap fastener half (5A), metal snap fastener half (5B), metal snap fastener half (6A) and metal snap fastener half (6B) are hammered or pressed directly onto the metal coated fabric assuring a good electrical connection between the articles of the present invention. The number of locations of the fasteners is not limited to the number of locations depicted in FIG. 1, FIG. 2, FIG. 3 and FIG. 4. A tie string pair (7A) and a tie string pair (7B) are illustrated at a plurality of locations on the long ground strap (4). The tie string pair (7A) and the tie string pair (7B) are for securing the long ground strap (4) to the user. In other embodiments of the present invention, tie string pair (7A) and tie string pair (7B) can be replaced by other methods of securing the long ground strap (4) to the user's leg including adjustable straps and Velcro strips.

[0015] Referring now to FIG. 2, a first embodiment of the present invention is shown as an ensemble of the upper torso

garment (1) and the lower torso garment (2). This embodiment illustrates that the upper torso garment (1) is fastened to the lower torso garment (2) with metal snap fastener half (5A) and metal snap fastener half (5B). This embodiment illustrates that each leg of the lower torso garment (2) is of sufficient length to be in contact with a floor (8). If the legs of the lower torso garment (2) are in contact with a floor (8) made of asphalt, concrete, tiling, wood or any other insulating material, the good electrical ground would not be established. In the case of the floor (8) being a metal surface that has been grounded to a good electrical ground, a path for electric current would be established. This embodiment of the present invention, when worn, has complete electrical continuity with a path for electric stun current between the delivery system electrodes and a path for electric stun current from a single delivery system electrode to the floor (8) through the legs of the lower torso garment (2). In this, the first embodiment of the present invention, the abdomen, ankles, back, calves, chest, hips, knees, legs, shoulders and thighs are protected from the direct contact method and the two tethered electrode-projectile method. The arms, elbows, feet, hands, head, neck and wrists are not protected. If the upper torso garment (1) is a long sleeve shirt or the like, the arms, elbows and wrists are protected.

[0016] Referring now to FIG. 3, a second embodiment of the present invention is shown as an ensemble of the upper torso garment (1), the lower torso garment (2) and the short ground strap (3). This embodiment illustrates that the upper torso garment (1) is fastened to the lower torso garment (2) with metal snap fastener half (5A) and metal snap fastener half (5B). This embodiment illustrates the short ground strap (3) with the metal snap fastener half (6B) fastened to a snap fastener half (6A) at the bottom of one leg of the lower torso garment (2). The short ground strap (3) is of sufficient length to be in full contact with the floor (8). If the ground strap (3) is in contact with a floor (8) that is a surface made of asphalt, concrete, tiling, wood or any other insulating material, a good electrical ground will not be established. In the case of the floor (8) being a metal flooring surface that has been grounded to the good electrical ground, a path for electric current would be established. The legs of the lower torso garment (2) can be made long enough to make a good electrical contact with the floor (8). This embodiment of the present invention, when worn, has complete electrical continuity with a path for electric stun current between the delivery system electrodes and a path for electric current from a single delivery system electrode to the floor (8) through the short ground strap (3). In this, the second embodiment of the present invention, the abdomen, ankles, back, calves, chest, hips, knees, legs, shoulders and thighs are protected from the direct contact method and the two tethered electrode-projectile method. The arms, elbows, feet, hands, head, neck and wrists are not protected. If the upper torso garment (1) is a long sleeve shirt or the like, the arms, elbows and wrists are protected.

[0017] Referring now to FIG. 4, a third embodiment of the present invention is shown as an ensemble of the upper torso garment (1) and the long ground strap (4). This embodiment illustrates the long ground strap (4) with the metal snap fastener half (5A) fastened to a snap fastener half (5B) at the bottom of the upper torso garment (1). The long ground strap (4) is of sufficient length to be in contact with the floor (8). This embodiment of the present invention, when worn, has complete electrical continuity with a path for electric stun current between the delivery system electrodes and a path for

electric current from the delivery system electrodes to the floor (8) through the long ground strap (4). In this, the third embodiment of the present invention, when worn, the back, chest and shoulders are protected. The abdomen, ankles, arms, calves, elbows, feet, hands, head, hips, knees, legs, neck, thighs and wrists are not protected. If the upper torso garment (1) is a long sleeve or the like, the arms, elbows and wrists are protected.

[0018] In another embodiment of the present invention, the upper torso garment (1) is the only article worn by the user. In this embodiment, the user is protected if both of the probes of the direct contact method or both of the electrode-projectiles of the two tethered electrode-projectile method make contact with the upper torso garment (1) thus short circuiting the hand held power supply of the electric stun device. In this embodiment of the present invention, the body of the present invention user cannot be electrically grounded if only one electrode-projectile of the two tethered electrode-projectile method is in contact with the present invention. If so, the electric stun device will have a debilitating effect.

[0019] Still, in another embodiment of the present invention, each article of the present invention can be used as a liner for a non-conductive garment of the same type and style that is made specifically for use with the article of the present invention or purchased from a retail store. This would effectively conceal the present invention making it inconspicuous and unobvious in appearance. In this embodiment of the present invention, the article of the present invention can made to be removable from or permanently bonded to the non-protective garment. Methods of bonding include adhesive application and sewing. Such techniques are well known to those skilled in the art. Making the present invention removable from a retail article is an object of the present invention in that the concealment of the present invention is an option. The article of the present invention is attached to the inside of a retail article by any well known fasteners that includes buttons, hook and eye type, hook and loop type, pins, snaps, zippers and the like.

[0020] The advantages of the present invention include, without limitation, the effectiveness of protection, the ease of concealment, the relative comfort when worn, minimal decrease of mobility when worn and the relative ease of manufacture.

[0021] While the foregoing written description of the invention enables one of ordinary skill to make and use what is considered presently to be the best mode thereof, those of ordinary skill will understand and appreciate the existence of variations, combinations, and equivalents of the specific embodiment, method, and examples herein. The invention should therefore not be limited by the above described embodiments, methods, and examples, but by all embodiments and methods within the scope and spirit of the invention as claimed.

I claim:

1. An electrically conductive protective garment ensemble of articles worn to nullify the debilitating effects of an electric stun device by providing an electrical short circuit between two electrode-projectiles or probes of said electric stun device or by providing an electrical short circuit between a single electrode-projectile and an electrically grounded floor comprising:

a upper torso garment constructed of a metal coated fabric selected from the group comprising coats, jackets, jer-

seys, long sleeve shirts, ponchos, pullovers, short sleeve shirts, sleeveless shirts, sweaters and vests;
a lower torso garment constructed of a metal coated fabric covering the entire length of each leg selected from the group comprising jeans, pants and trousers;
a long ground strap constructed of a metal coated fabric;
a short ground strap constructed of a metal coated fabric.

2. The electrically conductive protective garment ensemble of claim 1 wherein said metal coated fabric is made from a base fabric selected from the group including continuous loop, knit, nonwoven point bonded and rip stop.

3. The electrically conductive protective garment ensemble of claim 1 wherein said metal coated fabric is coated with an electrically conductive metal selected from the group including copper, gold, nickel and silver.

4. The electrically conductive protective garment ensemble of claim 1 wherein said metal coated fabric comprises at least one layer.

5. The electrically conductive protective garment ensemble of claim 4 wherein said articles are selectively attached or removed from an appropriate article by fasteners at a plurality of locations on each said article such that a good electrical connection is made between fastened said articles;

6. The electrically conductive protective garment ensemble of claim 5 wherein said fasteners are selected from the group including buttons, hook and eye type, hook and loop type, pins, snaps and zippers.

7. The electrically conductive protective garment ensemble of claim 6 wherein said upper torso garment is attached to said lower torso garment with said fasteners.

8. The electrically conductive protective garment ensemble of claim 7 wherein each leg of said lower torso garment is in contact with said electrically grounded floor.

9. The electrically conductive protective garment ensemble of claim 7 wherein said short ground strap is attached to a leg of said lower torso garment with said fasteners and the unattached end of said short ground strap is in contact with said electrically grounded floor.

10. The electrically conductive protective garment ensemble of claim 6 wherein said long ground strap is attached to said upper torso garment with said fasteners and the unattached end of the said long ground strap is in contact with said electrically grounded floor.

11. The electrically conductive protective garment ensemble of claim 4 herein said articles are used as liners for non-conductive retail garments to conceal said articles.

12. The electrically conductive protective garment ensemble of claim 11 wherein said articles used as said liners are removable from said non-conductive retail garments by fasteners selected from the group including buttons, hook and eye type, hook and loop type, pins, snaps and zippers.

13. The electrically conductive protective garment ensemble of claim 11 wherein said articles used as said liners are permanently bonded to said non-conductive retail garments.

14. The electrically conductive protective garment ensemble of claim 4 wherein said upper torso garment is worn without other said articles.

15. The electrically conductive protective garment ensemble of claim 14 wherein said upper torso garment is used as a liner for a non-conductive retail garment.

16. The electrically conductive protective garment ensemble of claim 15 wherein said upper torso garment used as said liner is removable from said non-conductive retail

garment by fasteners selected from the group including buttons, hook and eye type, hook and loop type, pins, snaps and zippers.

17. The electrically conductive protective garment ensemble of claim 15 wherein said upper torso garment used as said liner is permanently bonded to said non-conductive retail garment.

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