

Bullet Resistant Articles and Methods Of Use

Inventor: James W. McKell

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Patent 61/030,787 filed 22 Feb. 2008.

5 TECHNICAL FIELD

[0002] This application relates generally to bullet resistant articles and methods of their use.

BACKGROUND

[0003] Workplace and school shootings often leave victims with no defensive recourse when trapped or blocked by an assailant from escaping. Many assailants are employees or students who
10 can circumvent security efforts by having access to areas with passes, keys, permits, etc. It would be desirable to provide students, employees, etc. with defensive and offensive capabilities so that they can protect themselves and possibly disarm an assailant armed with a gun or knife or even explosives.

SUMMARY OF INVENTION

[0004] In an aspect, a bullet resistant article for use as a piece of furniture includes a shield portion
15 and multiple leg assemblies extending therefrom where each leg assembly includes a removable baton for use in protection against an attacker.

[0005] The details of one or more embodiments are set forth in the accompanying drawings and the description below. Other features, objects, and advantages will be apparent from the description and drawings, and from the claims.

20 BRIEF DESCRIPTION OF THE DRAWINGS

[0006] The accompanying figures depict multiple embodiments of bullet resistant articles and methods for using the same. A brief description of each figure is provided below.

[0007] Fig. 1 illustrates an embodiment of a bullet resistant article in a desk configuration.

[0008] Fig. 2 illustrates the bullet resistant article of Fig. 1 in a bench configuration.

25 [0009] Fig. 3 illustrates the bullet resistant article of Fig. 1 in a standing or defensive configuration.

[0010] Fig. 4 illustrates the bullet resistant article of Fig. 1 in a second standing or defensive configuration with defensive instruments detached.

- [0011] Figs. 5 and 6 detail the use of the bullet resistant article of Fig. 1 by a sheltering user.
- [0012] Figs. 7 and 8 illustrate a method of using the bullet resistant article of Fig. 1.
- [0013] Fig. 9 is a detail of a bullet resistant window for use with the bullet resistant article of Fig. 1.
- [0014] Fig. 10 illustrates another embodiment of a bullet resistant article.
- 5 [0015] Fig. 11 illustrates various baton section embodiments for use with bullet resistant articles.
- [0016] Fig. 12 illustrates another embodiment of a bullet resistant article.
- [0017] Fig. 13 illustrates a second operational mode of an embodiment of a bullet resistant article.
- [0018] Fig. 14 illustrates another operational mode of an embodiment of a bullet resistant article.
- [0019] Fig. 15 shows a bullet resistant article embodiment being transported by a sheltering user.
- 10 [0020] Fig. 16 illustrates a detail of an embodiment of a hinge structure.
- [0021] Fig. 17 is a detail view of another embodiment of a hinge structure with overlap.
- [0022] Fig. 18 illustrates a third embodiment of the bullet resistant article.
- [0023] Fig. 19 illustrates a third embodiment of the article shown in Fig. 18 folded upright.
- [0024] Fig. 20 details elements of a third embodiment of the article shown in Fig. 18.
- 15 [0025] Fig. 21 details features of embodiments of the removable portion of the leg.
- [0026] Fig. 22 details a fourth embodiment of the bullet resistant article with extended legs.
- [0027] Fig. 23 details a fourth embodiment of the bullet resistant article with collapsed legs.
- [0028] Fig. 24 details a fourth embodiment of the bullet resistant article configured as a chair.
- [0029] Fig. 25 details a fourth embodiment of the bullet resistant article configured as a chair with
20 cushions.
- [0030] Fig. 26 details elements of an embodiment of a hinge.
- [0031] Fig. 27 details a fourth embodiment of the bullet resistant article folded for storage.
- [0032] Fig. 28 details latch elements of a fourth embodiment of a bullet resistant article.
- [0033] Fig. 29 details a fifth embodiment of a bullet resistant article.
- 25 [0034] Fig. 30 details a yet another embodiment of a bullet resistant article, a fabric article.
- [0035] Fig. 31 details yet another embodiment of a bullet resistant article, a shield chair article.

[0036] Fig. 32a & 32b detail embodiments of bullet resistant panels.

DETAILED DESCRIPTION

[0037] Multiple embodiments of bullet resistant articles and methods for using the same are presented herein. Those of ordinary skill in the art can readily use this disclosure to create alternative
5 embodiments using the teaching contained herein.

[0038] Referring to Fig. 1, a bullet resistant article 10 includes a surface or top 12 and legs 14, 16, 18 and 20 that support the top 12 at a position above the ground 38. The legs 14, 16, 18 and 20 collectively are referred to as supports that allow the top 12 to be disposed and supported on the ground 38 or floor while an individual leg 14, 16, 18 or 20 are each a support. As appreciated by one of ordinary skill in the
10 art, different numbers of supports is selected by a designer in the art in part on aesthetic concerns and in part on the need for stability and structural support and thus may comprised combinations of 3, 4 or more supports. The top 12 in the embodiment depicted in Fig. 1 is smooth and suitable for writing on. The legs 14, 16, 18 and 20 are movably connected to the top 12. Guide brackets 22 are used to guide the legs 14, 16, 18 and 20 as they are rotated relative to the top 12.

[0039] The top 12, in the embodiments of the bullet resistant article 10 depicted in Figs 1 and 2 is formed of a bullet resistant material, such a material formed from aromatic polyamides or aramids, as exemplified by materials such as Kevlar[®]. In other embodiments the bullet resistant article is formed by other means known to those of ordinary skill in the art and may be formed as a unitary element or as a composite of multiple materials in addition to or instead of an aramid based material, including, but not
20 limited to, Lexan[®] or other thermoplastic resins, carbon fiber composite materials, ceramics, steel, titanium, combinations thereof as known to those of ordinary skill in the art. In one aspect, the bullet resistant article 10 is formed of an aramid bullet resistant material that is mounted to a structural frame wherein the frame is adapted to support the bullet resistant material and substantially remove the bullet resistant material from the bullet resistant article's 10 structural load path.

[0040] As can be seen by the embodiments shown in Figs. 1 and 2, the bullet resistant article 10, sometimes referred to herein as the article 10, is capable of being adapted to multiple types of furniture articles, such as a desk or table configuration of the embodiment shown in Fig. 1, a coffee table or a bench as shown in Fig. 2. The embodiment shown in Fig. 1 depicts the bullet resistant article 10 in a table configuration with its legs 14, 16, 18 and 20 in fully extended positions forming a desk
30 configuration. In the embodiment shown in Fig. 1, the top 12 in one embodiment is placed at an elevation suitable for sliding a chair 25 there under. Fig. 2 shows the article 10 in a bench configuration where the legs 14, 16, 18 and 20 are shortened so that the top 12 is close to the floor. The top 12 is located such that

a person can sit on the top. Cushions 24 are disposed on the top 12 of the embodiment of the article 10 shown in Fig. 2 to provide a more comfortable seating position for a human sitting on the article 10. The cushions 24 in one embodiment are removably secured to the top 12 by any suitable fashion such as ties (e.g., that tie around the legs), buttons, slip pockets, hook and loop fasteners, or other methods known to those of ordinary skill in the art for securing cushions 24 to a surface. In another embodiment, the cushions 24 are secured to the top 12 using a semi-permanent means known to those of ordinary skill in the art such as glue, epoxy, thermal welding, bolts or other means. As can be appreciated by one of ordinary skill in the art, for aesthetic details of the bullet resistant article 10 is readily adapted to incorporate various ornamentation and other decorative elements to modify the aesthetic appearance of the article 10.

[0041] Referring now to Figs. 3 and 4, the table embodiment of the article 10 shown in Fig. 1 is depicted in multiple defensive or standing configurations, also referred to herein as modes, behind which a person can take cover during or in anticipation of an attack. As used herein, when a person adopts a defensive posture behind an article 10 such that a bullet resistant portion is interposed between a perceived threat and the person, is referred to as sheltering. As appreciated by one of ordinary skill in the art, the person using the article 10 would dispose the top 12 between themselves and the perceived threat axis 35 during or in anticipation of an attack. In the embodiments of the standing modes depicted in Figs. 3 and 4, two of the legs 14 and 16 support the article 10 upright in the standing mode such that the top 12 extends upwardly from the floor in a direction substantially perpendicular to the floor or ground 38. In some embodiments, in the standing modes, a lower edge 26 of the top 12 is flush with the ground 38. In still another embodiment, the lower edge 26 comprises a high friction surface to reduce slippage when placed on the floor or ground. In an alternative embodiment, the lower edge 26 comprises one or more bearing surfaces adapted to allow a sheltering person to readily reposition the article 10 as the perceived threat axis shifts. As appreciated by one of ordinary skill in the art, the article 10 is readily adapted to allow a sheltering user to place any edge of the article 10 on the ground whereby the edge contacting or otherwise supported directly or indirectly on the ground 38 thus becomes the lower edge 26.

[0042] The height of the top 12, , the height H of the top 12, shown in Fig. 3 is selected by a person of ordinary skill in the art to be sufficient such that a person of average height and build can crouch behind the top. In one exemplary embodiment the height H is at least about three feet. In another exemplary embodiment, the height H is at least about four feet. In yet another exemplary embodiment, the height H is at least about five feet. In still another embodiment, the height H is at least about six feet, allowing an average sheltering user 42 to stand erect behind the article 10.

[0043] In the embodiment depicted in Figs. 3 and 4, a vision port, aperture or more generally a window 28 is provided near an upper edge 30 of the top 12. The window 28 is located such that the person behind the top 12 can see out the window without exposing a portion of their head or other body parts. The window 28 in the embodiment depicted is filled with a transparent bullet resistant material selected by one of ordinary skill in the art, such as bullet resistant glass or plastic, or more generally a transparent bullet resistant material. In one embodiment the bullet resistant material is a layered material comprising multiple sheets of glass and polycarbonate. In another embodiment, a one-way transparent bullet resistant material is used such that a bullet fired toward the top 12 from the side disposed toward the threat is more likely to be stopped while a bullet fired from the opposing surface, the side where the person is sheltering is able to pass through the one-way bullet resistant material. In some embodiments, the window 28 may be tinted or mirrored to prevent viewing of the person behind the window.

[0044] Fig. 5 shows the upper legs 18 and 20 in a semi-lowered position while the lower legs 14 and 16 are used to support the top 12. In another embodiment, not shown, the window 28 is filled with a removable block that is adapted to be pushed out of the window 28 or otherwise removed from the window 28 to allow the person sheltering behind the article 10 to view the perceived threat. In still another embodiment the window 28 is a small loop-hole or vision port that is relatively small in size or otherwise adapted to be difficult for a bullet or other object to penetrate the top 12 via the window 28.

[0045] In the embodiment shown in Fig. 4, the legs 14, 16, 18 and 20 are assemblies including a housing or support portion 32 and a defensive weapon removable portion 34, such as a throwing projectile or baton that is removable from the support portion 32. The defensive weapon removable portion 34, or more generally the removable portion 34, in one embodiment is balanced and/or weighted (e.g., at one end) or otherwise adapted by one of ordinary skill in the art to be thrown at an attacker. The removable portion 34 is adapted to be readily removed from the support portion 32 using mechanisms known to those of skill in the art, including, coarse threads, quarter turn interrupted threads, quick release collars, collars with set screws, spring pin and hole joints, and bayonet-style quick release mechanisms.

[0046] In some embodiments, the removable portions 34 may include an implement such as a spear or knife for offensive use, as detailed later herein. The embodiment depicted in Fig. 4 shows all the removable portions 34 separated from the support portions 32. In the embodiment depicted the sheltering person is able to detach the removable portions 34 while remaining substantially behind the bullet resistant top 12 of the article 10. In other embodiments, the defensive weapon removable portion 34 includes other weapon systems such as, but not limited to, a stun gun, a Taser[®] or other standoff electrical incapacitation device, a chemical irritant or incapacitant such as mace or pepper spray, a beanbag projectile weapon, a bullet and gun tube, a deployable chemical restraint such as a rapid hardening glue or

foam restraint, or a blinding device such as a strobe or laser. In still another embodiment, a blinding device affixed to the surface 12 and directed perpendicularly away from the surface 12 such that when the sheltering user 42 orients the surface 12 in the direction of the threat axis 35, the blinding device also oriented along the threat axis 35.

5 [0047] In the embodiment of the article 10 depicted in Fig. 4, a handle 36 is provided on a rear surface of the top 12 that is graspable by the person to transport or manipulate the article 10. In one method of using the article 10 the sheltering user grasps the handle 36 to re-orient the top 12 of the article 10 toward the perceived threat axis as the attack develops. In another method of using the article 10 a first sheltering user gasps the handle 36 to stabilize and orient the article 10 while a second sheltering user
10 employs one or more removable portions 34 against the threat.

[0048] Figs. 5 illustrates a method of using the article 10 for protection during an attack where a sheltering user 42 shelters behind the article 10. In the embodiment shown in Fig. 5, the sheltering user 42 places the top 12 of the article 10 with its lower edge 26 disposed toward the ground 38 with legs 14 and 16 supporting the top 12 in the illustrated upright position. As can be seen, the window 28 is
15 located about eye level in this orientation such that the person sheltering behind the article 10 may see through the top 12. The window 28 is adapted and the legs 18, 20 spaced, by one of ordinary skill in the art, so that folding the legs down does not obstruct the window 28. In other embodiments the, legs 18, 20 are be spaced to allow a sheltering user 42 of average build to fit therebetween.

[0049] Referring now to the embodiment shown in Fig. 6, a close-up image of the legs 18 and 20
20 that are on the opposite end of the article 10 away from the lower edge 26 are depicted in a partially collapsed or folded down position. In the embodiment depicted the removable portions 34 are shown detachably mounted to the support portion 32 via a collar with thumb screws 33. In other embodiments not depicted the removable portion 34 is removably attached to the support portion 32 via other means known to those of ordinary skill in the art including, without limitation: a threaded pipe fitting, a press fit,
25 a clamp, a locking ball and detent, or a pin. Referring again to the embodiment depicted in Fig. 6, the sheltering user 42 is able to remove the removable portion 34 from the support portion 32 by loosening the thumb screws 33 and pulling the removable portion 34 away from the support portion 32. In the embodiment depicted, the legs 18 and 20 are partially deflected to allow the sheltering user 42 to remove the removable portions 34 without exposing any portion of the sheltering user's 42 body to the threat. In
30 another embodiment, the legs 14, 16, 18 and 20 are rotatably attached to the article 10 allowing the legs 14, 16, 18 and 20 to be rotated from a support position to a storage or handling position substantially aligned with the top 12. In this embodiment, the support portion 32 is attached to the article 10 via a hinge element or guide brackets 22 as known to those of ordinary skill in the art that allow the support

portion 32 to rotate relative to the top 12 and thus allow the legs 14, 16, 18 and 20 to fold substantially flush against the top 12.

[0050] In the method of using the embodiment depicted in Fig. 5 and 6, the sheltering user 42 is able to wield the removable portion 34 against an oncoming attacker to deter or deflect an attack. In the use
5 embodiment shown in Fig. 7, the sheltering user 42 is kneeling behind the article 10 such that the sheltering user's 42 body is substantially behind the top 12. The sheltering user 42 interposes the top 12 between him/herself and the attacker (not shown), substantially perpendicular to the likely threat axis 35 (which in most embodiments is a straight line between the sheltering user 42 and the attacker or the expected location of the attacker). In the method depicted in Fig. 7, the sheltering user 42 is preparing to
10 hurl the removable portion 34 in the direction of the attacker which in this case is along the threat axis 35.

[0051] In another method of using the article 10, depicted in Fig. 8 the sheltering user 42 grasps the article 10 using a handle 36 or other grab points on the article 10 such as the edges or legs 14, 16, 18, and 20 to orient the top 12 toward the attacker. Then in this embodiment of a method of using the article, where the sheltering user is able to move the article 10, the sheltering user 42 may, at the users option,
15 either: (a) advance or charge the attacker closing distance with the attacker in an attempt to disarm or otherwise subdue the attacker; (b) remain in the same position while rotating the article 10 as needed substantially around the user to maintain the top 12 interposed between the sheltering user and the attacker; or (c) retreat from the vicinity of the attacker. As shown in the method of using the article 10 depicted in Fig. 8, the sheltering user 42 is able to wield the removable portion 34 against an attacker
20 while observing the attacker through the window 28 and remaining substantially or protected behind the top 12.

[0052] Fig. 9 shows a detail view of the aperture or window 28. The window 28 in the embodiment of the article 10 depicted in Fig. 9 is fabricated from a transparent bullet resistant material that is embedded within the top 12. The window 28 is adapted to allow a sheltering user 42 to visualize a threat
25 approaching from the other side of the top 12. The window 28 depicted in Fig. 9 is affixed to the top 12 via a support frame 40. In other embodiments, the window 28 is directly formed within the bullet resistant material of the top 12. In another embodiment, the support frame 40 comprises non-bullet resistant materials that form a portion of the top 12 that substantially affix the window 28 to the remainder of the bullet resistant material that comprises the top 12.

[0053] Referring to Fig. 10, an alternative bullet resistant article embodiment, in this case a multipart article 44 is shown that includes many of the features described above with respect to article 10. In this embodiment, a surface 46 includes a joint 48 (e.g., provided by a hinge) that allows a first section 50a of the surface 46 to pivot relative to a second section 50b of the surface 46. In this manner, the multipart
30

article 44 is configurable in a first or chair mode, pictured in Fig. 10, wherein the first section 50a and the second section 50b are at an angle greater than 45 degrees to each other. In a similar manner, the multipart article 44 is also configurable in a second flat mode or table mode where first section 50a and second section 50b are substantially parallel to each other. In an embodiment of the second mode a third pair of legs are used (not shown in Fig.10) to support the far end 51 of the second section 50b. In another embodiment, a locking hinge 48 is used to fix the multipart article 44 in a desired mode (i.e. flat or chair modes).

[0054] The first section 50a and the second section 50b are comprised of a bullet resistant material similar to the other embodiments discussed herein. In one embodiment, the joint 48 is comprised of a flexible bullet resistant fabric or blanket that allow the first section 50a and the second section 50b to swing relative to each other. In another embodiment, the joint 48 is adapted to minimize the gap between the edge of the first section 50a and the second section 50b.

[0055] In another embodiment, the legs 14, 16, 18, and 20 of the multipart article 44 are comprised of a straight leg 41 with a thumb screw 33 to affix the straight leg 41 to the multipart article 44. In another embodiment, the straight leg 41 comprises a twist compression coupling 43 affixed to one end that attaches the straight leg 41 to the multipart article 44. In yet another embodiment, a multi-element leg 47, comprising a first leg element 47a and a second leg element 47b is used. A compression joint 49 is used to extend and retract the second leg element 47b from within the inside of the first leg element 47a allowing a user to adjust the height of the multipart article 44. In some embodiments of the multipart article 44 the straight leg 41 and the multi-element leg 47 are adapted operate as a defensive weapon removable portion 34 suitable for use by a sheltering user 42. In yet another embodiment, the coupling, such as the twist compression coupling 43 or the collar used by the thumb screw 33 are weighted to increase the hitting power of the detached straight leg 41 or multi-element leg 47.

[0056] Referring now to Fig. 12, another embodiment of the article 10, in this case a second article 52 is depicted. The second article 52 comprises a seat surface 54 and a back surface 56 which together form a surface 46 of the second article 52. In the embodiment of the second article 52 depicted in Fig. 12, a window 28 is disposed within the back surface 56. The seat portion 54 and back portion 56 are pivotally attached via a joint 48. In one embodiment, a spring ratchet mechanism is used to allow the joint 48 to fold the seat portion 54 and the back portion 56 into three separate modes, a storage mode wherein the seat portion 54 and the back portion 56 are substantially overlapping, a seat mode wherein the seat portion 54 and the back portion 56 form at least a 30 degree angle or a flat mode where the seat portion 54 and the back portion 56 are substantially parallel. The seat portion 54 and back portion 56 are formed of a suitable bullet resistant material. As detailed with respect to other embodiments herein, other

embodiments of the seat portion 54 and back portion 56 are comprised of additional non-bullet resistant materials such as frames, coatings, and coverings. The seat surface 54 is supported via four legs 14, 16, 18 and 20.

[0057] In the embodiment shown in Fig. 12, a pair of cushions 66 and 68 is detachably mounted to the second article 52. In one embodiment, the cushions 66 and 68 are decorative or used to provide support to the user. In another embodiment, the cushions 66 and 68 are comprised at least in part of a bullet resistant material, such as a fabric or blanket-like bullet resistant material. In one embodiment, the back cushion 68 is sized so as not to obstruct the window 28. In another embodiment, the cushions 66 and 68 comprise a bullet resistant material and are adapted to be held by a second user.

[0058] Fig. 13 illustrates a second operational mode of the second article 52. In this embodiment the front legs 14 and 16 are folded to have an acute angle (α) relative to the seat surface 54 of less than about 75 degrees and the seat surface 54 is tilted forward causing the second article 52 to adopt a kneeling stance. In the second operational mode the back surface 56 is further rotated from an upright or chair position with an angle (β) of between about 60 degrees and about 90 degrees, shown as 56a, to a position substantially parallel to the seat surface 56, or an angle β between about 15 degrees to -15 degrees. In this second operational mode, the sheltering user 42 positions the seat surface 54 in the direction of the perceived threat axis 35. In this mode, the leg hinges 58 supports the second article 52 on the ground 38. In one embodiment the leg hinges 58 are adapted to provide a low-friction surface to allow the sheltering user 42 to rotate the second article 52 and keep the seat surface 56 and back surface 56 substantially perpendicular to the threat axis 35.

[0059] Fig. 14 details a third operational mode of the second article 52. In this operational mode, the sheltering user 42 adopts a substantially more upright posture and the angle (α) of the legs 14 and 16 relative to the seat surface 54 are substantially closer to perpendicular. The sheltering user 42 is able to switch the second article 52 to this third operational mode by rotating the seat surface 54 relative to the lower legs 14 and 16 via the leg hinges 58.

[0060] In one embodiment, the leg hinges 58 are adapted to have a locking detent allowing the angle (α) of the legs 14 and 16 to be substantially fixed or held at a desired angle. In the embodiment shown in Fig. 14, one of the defensive weapon removable portions 34 is shown removed from the support portion 32 of leg 18 (not shown) is being wielded by the sheltering user 42. In this embodiment, the defensive weapon removable portion 34 depicted is a baton.

[0061] Fig. 15 illustrates an embodiment of the second article 52 being used by a sheltering user 42 as a transport shield. In the embodiment shown the sheltering user 42 grasps a handle (not shown in Fig.

15) affixed to the back of the seat surface 54. The handle allows the sheltering user 42 to lift the second article 52 in an upright configuration allowing the sheltering user 42 to protect vital organs behind the bullet resistant window 28 and seat surface 54 and back surface 56 while allowing the sheltering user 42 to walk normally. In another embodiment, the sheltering user 42 grasps a support (not shown in Fig. 15) between the legs 18 and 20 to grasp the second article 52 allowing the sheltering user 42 to move the second article 52 while walking in a substantially upright posture. In the embodiment depicted, the second article 52 is being held by the sheltering user 42 using a single arm, while the sheltering user 42 brandishes the defensive weapon removable portion 34 in his other arm. In this manner the sheltering user 42 may either retire away from the perceived threat while keeping the second article 52 oriented substantially perpendicular to the threat axis 35 or alternatively allowing the sheltering user 42 to advance on the threat while remaining substantially protected behind the bullet resistant seat surface 54 and back surface 56 of the second article 52.

[0062] Referring now to Fig. 16, a detail view of the hinge assembly between the seat surface 54 and the back surface 56 is shown. The joint 48 in the embodiment shown is a rotational hinge that allows the back surface 56 to rotate relative to the seat surface 56. In one embodiment, the rotational hinge of the joint 48 has rotational detents allowing the angle (β) to be preferentially selected and held. In another embodiment the rotational hinge of the joint 48 uses a locking pin to fix the angle (β) between the seat surface 54 and the back surface 56. Other joints 48 are selectable they those of ordinary skill in the art to allow the angle (β) to be adjusted in order to adopt the operational modes of the article 10 or in the embodiment depicted the second article 52.

[0063] The hinge assembly, in the embodiment depicted details an overlapping portion 72 of the seat back 54. The overlapping portion 72 comprises a substantially bullet resistant material and is adapted to substantially cover the gap between the seat surface 56 and the back surface 54 that is formed between the edges of the seat surface 56 and the back surface 54 of this embodiment when the angle (β) is about 180 degrees.

[0064] In other embodiments, the joint 48 is adapted to rotate the back surface 54 around to allow the back surface 54 to either partially or fully overlap the seat surface 56. In the embodiment shown in Fig. 17 includes an offset joint 60 fixed to a tongue portion 62 of the seat surface 56. The offset joint 60 allows the back surface 54 to rotate from an upright orientation of the back surface 54a to an orientation that is substantially parallel 54b to the seat surface 56. In this manner the bullet resistant material of the back surface 54 partially overlaps a portion of the bullet resistant material of the seat surface 56. In other embodiments, readily formed by those of ordinary skill in the art using the teaching herein, the edge of the seat surface 56 may abut the edge of the back surface 54 or may overlap the full thickness of a portion

of the seat surface 56. As readily apparent, the foregoing embodiment shown with respect to the second article 52 are readily adapted to other embodiments of the bullet resistant article 10 that comprise more than one panel of bullet resistant materials that rotate relative to each other.

[0065] Referring now to Fig. 18, a third embodiment of the bullet resistant article 10, i.e. a third bullet resistant article or simply third article 76 is depicted in a normal operating configuration. The third article 76 is configured as depicted in Fig. 18 to adopt the overall form of a folding chair as known to those of ordinary skill in the art. The third article 76 includes a seat portion 78 a back portion 80 and a foldable frame 82 that comprises an embodiment of the supports namely legs 84, 86, 88, and 90. A ballistic panel 92 is affixed to the rear legs 88 and 90 and substantially covers the gap between the rear legs 88 and 90. In one embodiment, the seat portion 78, the back portion 80 and the ballistic panel 92 are all comprised of a bullet resistant material. In the embodiment depicted a window 28 is provided in the back portion 80. The window 28 in one embodiment is filled with a transparent bullet resistant material. In another embodiment, the window 28 adapted to form a small eyehole or loop hole that is adapted to minimize the ability of a threat to target the sheltering user 42 while still allowing the sheltering user 42 to view the threat. In the embodiment depicted in Fig. 18, the window 28 is formed to curve along with the seating surface of the back portion 80, thus providing a comfortable surface for the seated user. In another embodiment, the seat portion 80 and ballistic panel 92 comprise a bullet resistant material while the back portion 80 is a standard seating material, such as a fabric, polymer, ceramic, metal, or other material.

[0066] Referring now to Fig. 19, the third article 76 is shown in a second operational mode, a collapsed or standing shield mode, where the seat portion 78 is folded substantially against the back portion 80. In the embodiment of the third article 76 depicted in Fig. 19, the legs 84 and 86 are adapted to support the third article 76 in the upright configuration. In the embodiment the leg 84 is attached to the frame 82 and provides along with legs 88 and 90 a third point support on the ground 38. In one embodiment the leg 84 provides the sole support on the ground 38. In the embodiment depicted, the third article 76 is further supported by a kickstand 79. The kickstand 79 is adapted to fold against the body of the third article 76. The embodiment of the third article 76 includes the leg 84 that comprises a defensive weapon removable portion 34, shown removed from support portion 32 and on the ground 38.

[0067] Referring still to Fig. 19, the three elements of the third article 76 comprises a substantially uniform shield surface 74 comprised of bullet resistant material. In this embodiment, the back portion 80 abuts the seat portion 78 which in turn abuts the ballistic panel 92, thus forming a substantially uniform shield surface 74. In another embodiment, not shown in Fig. 19, portions of the back portion 80, the seat

portion 78, and the ballistic panel 92 overlap thus minimizing weak points or bullet traps formed in the uniform shield surface 74.

[0068] In another embodiment, shown in Fig. 20, a seat handle 100 is affixed to the underside of the seat portion 78 to allow a sheltering user 42 (not shown in Fig. 20) to grasp the third article 76.

5 [0069] Referring now to Fig. 21, two embodiments of the defensive weapon removable portion 34 are depicted. The first, a baton or club-like removable portion 34 comprises a concentric inner tube portion 98 that is adapted to fit within the support portion 32. The second embodiment of the removable portion 34 comprises a similar, but shortened concentric inner tube portion 98 and a spike 102. When the second embodiment of the removable portion 34 is mated with the support portion 32 the spike 102 is
10 concealed from view within the support portion 32.

[0070] Figs. 22-28 illustrate another embodiment of a bullet resistant article or fourth article 104 that is similar to aspects of the multipart article 44. The fourth article 104 includes a top surface 106 comprising a bullet-resistant material disposed in a first section 108a and a second section 108b that are pivotally connected by a hinge 110. Fig. 22 illustrates the fourth article 104 in a desk, bench or table mode with supports, or legs 112, 114, 116, 118, 120 and 122 each with extensions 112a, 114a, 116a, 118a, 120a, and 122a deployed extended to increase the height of the top surface 106. In the embodiment depicted the extensions 112a, 114a, 116a, 118a, 120a, and 122a are adapted to slide within the legs 112, 114, 116, 118, 120 and 122 and held in their deployed state by the use of mechanisms such as a collar and pin, a spring loaded pin and hole, a compression link, a collar with set screws, or other mechanisms
15
20 known to those of ordinary skill in the art.

[0071] Fig. 23 illustrates the fourth article 104 in a bench mode with the extensions 112a, 114a, 116a, 118a, 120a and 122a retracted into the legs 112, 114, 116, 118, 120 and 122 to lower the top surface 106. Cushions 124 are located on the top 106 and may be secured thereto, for example, by ties, hook and loop fasteners, etc. The cushions 124 in one embodiment comprise a bullet-resistant material.

25 [0072] Referring now to Fig. 24, the fourth article 104 is shown in a standing mode with the legs 112 (not shown) and 114 supporting the fourth article 104 in the standing position. A window 28 is provided in second section 108b.

[0073] Fig. 25 illustrates the fourth article 104 in a chair mode with the second section 108b pivoted out of the plane of the first section 108a. In the embodiment shown, the legs 120 and 122 are folded toward the rear of the second section 108b. The second section 108b is locked in place relative to the first section 108a using an angle brace 128 thus forming a chair-like configuration for the fourth article 104.
30

[0074] Fig. 26 shows the angle brace 128 and hinge 110 in detail. As shown in this embodiment, the angle brace 128 is fixed in position via a pair of thumb screws 129. In other embodiments, the angle brace 128 is fixed in place using spring loaded pins or other mechanisms to limit rotation of around the hinge 110 known to those of ordinary skill in the art.

5 [0075] Fig. 27 illustrates the fourth article 104 in a storage mode where the first and second sections 108a and 108b are folded over into a face-to-face relationship and the legs 112, 114, 116, 118, 120 and 122 are folded over to reduce the overall volume of the fourth article 104.

[0076] Fig. 28, illustrates latches 130 and 132 that are used for additional support of the sections 108a and 108b when the fourth article 104 is in the standing mode. In one embodiment, not shown, a
10 handle 100 is provided to maneuver the article 104. The embodiment of the fourth article 104 shown in Figure 28 provides the middle supports or legs 116 and 118 as comprised of a support portion 32 and a defensive weapon removable portion 34. Similar to the discussion above, the defensive weapon removable portion 34 is adapted to be readily removed from the support portion 32 to allow a sheltering user 42 (not shown in Fig. 28) to wield the removable portion 34 as a weapon. Also shown in Fig. 28, a
15 cross support handle 134 is provided between the legs 116 and 118 to allow a sheltering user 42 to grasp the fourth article 104 in the upright position.

[0077] Fig. 29 illustrates a fifth embodiment 74 of a bullet resistant article 10, or simply a fifth article 74. The fifth article 74 is frameless surface 180 comprised of a first frameless surface 186 and a second frameless surface 188 both comprised of a bullet resistant material. The second frameless surface
20 188 in the embodiment depicted further comprises a window 28. A handle 190 is provided for a sheltering user 42 (not shown in Fig. 29) to grasp and manipulate the fifth article 74. Tapering legs 182 and 184 are attached directly to the first frameless surface 186 with flanges 192 and hinge 194. The tapered legs 182 and 184 are comprised of a support flange portion 192 and a removable portion 34. The first frameless surface 186 provides a seating surface when the fifth article 74 is configured as a chair.
25 The second frameless surface 188 provides a seat back when the fifth article 74 is configured as a chair. In some embodiments, the above articles may include a small leg such as a door-stop type leg that can be wedged against the floor to maintain the article in the standing position. This can allow a victim to take cover behind the shield hands free, which can allow the victim, for example, to more readily use a cell phone. Non-ballistic versions of the articles may be useful as well as comfortable furniture that can be
30 used as a table, desk, bench or chair.

[0078] Referring now to Fig. 30, another embodiment of the bullet resistant article 10, in this case a fabric article 140 is shown. In many aspects the framed fabric article 140 is similar in configuration and use to the multipart article 44. The seat portion 142 of the framed fabric article 140 comprises a flexible,

bullet resistant wrap or blanket material 146 that is attached to the frame 148 thus forming the first surface 142 and second surface 144. The blanket 146 in one embodiment is affixed to the frame 148. In another embodiment, the blanket 146 is removably attached to the frame 148 via snaps, hook and loop fasteners or other fasteners known to those of ordinary skill in the art. The blanket 146 in this
5 embodiment includes a window 150 and in some embodiments contains foam or other padding. In other embodiments the blanket 146 is covered with a decorative covering that is able to be selected to match décor according to taste. In one embodiment, the blanket 146 is removable from the frame 148 and suitable for carriage independently from the frame 148. In other embodiments, the frame 148 is adapted to provide support for the fabric allowing a sheltering user 42 to use the framed fabric article 140 as a
10 whole. In some embodiments, a pouch is provided that carries extra batons, a first aid kit, etc. Straps may be provided for carrying. Accordingly, other embodiments are contemplated and modifications and changes could be made without departing from the scope of this application.

[0079] Referring now to Fig. 31, another embodiment of a bullet resistant article 10, in this case a shield chair article 149. The chair back 152 is formed of a bullet resistant material formed in a
15 substantially unitary piece creating a continuous ballistic shield. In one embodiment the chair back 152 is substantially flat. In another embodiment the chair back 152 is formed in a slight curve for improved ergonomics when used as a chair. In other embodiments, the chair back 152 is formed in part from a coating that forms the ergonomic structure of the chair back 152 while allowing the bullet resistant element to be formed in an alternative shape. In the embodiment shown, a window 28 comprising a
20 transparent bullet resistant material is used to allow a sheltering user 42 to view the threat.

[0080] The shield chair article 149 further comprises a seat 153 constructed of a non-bullet resistant material and attached to the chair back 152 via brackets 154, at a hinge 160 that allows the seat 153 to fold downward. The seat 153 is supported by one or more support hinges 156 that lock to support the seat 153 in a position allowing the shield chair article 149 to be used as a chair. In another embodiment,
25 the seat 153 is adapted to fold upward, away from the ground 38, and the hinge 160 is adapted to prevent the seat 153 from slipping downward when used in the chair configuration. In various embodiments, the surface of the seat 153 is flat, or curved to improve comfort. A handle 155 is formed into seat 153 and is slightly angled to allow access for the sheltering user 42 to grasp the handle 155 when seat 153 is folded down.

30 [0081] The shield chair article 149 further comprises legs 157, attached to chair back 152 with hinge 160 allowing the legs 157 to pivot in relation to chair back 152. In one embodiment, stops are provided to prevent legs from pivoting beyond approximately 60 degrees in either direction. Legs 157

comprise a support portion 32 and a removable portion 34 connected via quick release couplings 158 to allow a sheltering user to remove the defensive weapon removable portion 34.

5 [0082] Referring now to Fig. 32a and 32b, two embodiments for incorporating a bullet resistant material into an article 10 are depicted. Referring now to Fig. 32a and the Section A-A, a bullet resistant material 200 is held within a metal frame 202 for form a bullet resistant panel 204. The metal frame 202 provides the structure support for the panel 204. In this embodiment, the metal frame 202 is further covered by a decorative shroud 206 comprising a covering, or veneer to protect the bullet resistant material 200. In a second embodiment, shown in Fig. 32b, the bullet resistant material 200 is sandwiched or held within a decorative enclosure 208. The decorative enclosure is adapted to both hold the bullet resistant material 200 and form the exterior surface of the bullet resistant panel 204. The decorative enclosure 208 and decorative shroud 206 are formed using materials known to those of ordinary skill in the art for use with furnishings, such a wood veneer, an engineered veneer, a molded plastic, a ceramic, a fabric, or a glass and composites thereof. As readily apparent to those of ordinary skill in the art, bullet resistant panels formed in this manner are readily adapted to the various embodiments of the bullet resistant articles 10 described herein for use as surfaces, panels and the like.

10 [0083] The foregoing bullet resistant articles are also useful in other situations, such as escaping from a burning building as many bullet resistant materials have a high resistance to fire and heat. In one application, a person would use the article to break through burning debris and windows and crawl close to the floor with the article overhead. The present bullet resistant articles are also readily adapted to be used for protection during an earthquake. Also, the articles may be used to escape from rioters in the streets around a building.

20 [0084] The above-described bullet resistant articles can be placed an a classroom, workplace, residence, etc. and serve as a functioning chair, bench, table, etc. while capable of converting into a ballistic shield in the event of an attack. In the various embodiments described herein, the size of the shield is selected by one of ordinary skill in the art. In one embodiment a person of ordinary skill in the art sizes the article 10 to be large enough to cover protect vital organs of a sheltering user 42 while also fitting through hallways and doorways without the need to turn sideways. In other embodiments, the size of the article 10 is selected to have a weight of about 30 pounds or less for increase maneuverability. In some embodiments, the ballistic shield provided by the articles is designed to meet certain standards, such as National Institute of Justice (N.I.J.) standard 101.

30 [0085] Police often cannot respond to a shooting in less than five minutes. Often the damage is done before the police or other security can arrive. Because the bullet resistant articles appear as furniture, the victim may be afforded an element of surprise when the articles are used. The element of surprise when

an attacker confronts a victim can be advantageous for the victim. The bullet resistant articles can be placed within arms reach of a victim for immediate deployment in a normal environment without being noticed by the general public. Thus, it is unnecessary to hang riot shields and clubs on a wall to achieve the same result. Public awareness of use of the articles can also create a deterrent to a potential attacker.

5 The defensive weapon removable portions provide an element of offense or additional defense against the attacker. However, it may not be necessary to confront an attacker to achieve beneficial results from the bullet resistant article. The bullet resistant article can provide an effective method of escaping from an attack by providing cover. The bullet resistant articles may be suitable for use in schools, offices, various other public buildings such as military and government buildings such as an embassy, war zones, to
10 protect armed and unarmed workers and civilians.

CONCLUSION

[0086] While various embodiments of bullet resistant articles and methods of using the same are described above, it should be understood that the embodiments have been presented by the way of example only, and not limitation. It will be understood by those skilled in the art that various changes in
15 form and details may be made therein without departing from the spirit and scope of the invention as defined. Thus, the breadth and scope of the present invention should not be limited by any of the above described exemplary embodiments.

1 **What is claimed is:**

1 1. A bullet resistant article for a human comprising:

2 at least one surface comprised of a bullet resistant material and forming a portion of an
3 article of furniture selected from the group consisting of: a seat surface, a seat back, a
4 bench surface, a table surface and a desk surface;

5 a support coupled to said surface; and

6 a means for the human to grasp the bullet resistant article and dispose said one surface
7 between the human and a threat wherein said support remains coupled to said surface.

1 2. The article of claim 1, wherein said one surface contains an aperture that contains a
2 transparent bullet resistant material.

1 3. The article of claim 1, wherein a portion of said support is adapted to be detached from
2 said surface and said portion comprises a weapon.

1 4. The article of claim 1, wherein said means for the human to grasp said article of furniture
2 comprises a handle disposed on said one surface.

1 5. The article of claim 1, further comprising a second surface that is rotatably attached to said
2 one surface to allowing said one surface and said second surface to rotate between substantially
3 perpendicular and substantially parallel to each other.

1 6. The article of claim 5, wherein said first surface is a seat back and said second surface is a
2 seat surface.

- 1 7. An device comprising:
- 2 a first surface comprised of a bullet resistant material;
- 3 a support coupled to said first surface;
- 4 a first configuration whereby said first surface is disposed relative to said support to
- 5 allow the device be configured as an article of furniture selected from the group
- 6 consisting of: a chair, a bench, a desk and a table;
- 7 a second configuration whereby said surface is disposed relative to said support, wherein
- 8 said second configuration is adapted to shelter a human behind said first surface.
- 1 8. A device of claim 7, wherein said first surface is selected from the group consisting of: a
- 2 chair seat, a chair back, a bench top, a table top and a desk top.
- 1 9. A device of claim 7, wherein a portion of said support is detachably coupled to said first
- 2 surface.
- 1 10. A device of claim 9, wherein said portion of said support further comprises a sharpened
- 2 element that is exposed when said portion is detached from said support.
- 1 11. A device of claim 7, wherein said first configuration is said chair and said first surface
- 2 comprises the back of said chair.
- 1 12. A device of claim 11, further comprising a second surface comprised of a bullet resistant
- 2 material adapted to serve as a chair seat in said first configuration and wherein said first surface
- 3 is said chair back.
- 1 13. A device of claim 12, wherein said first surface further comprises a first edge and said
- 2 second surface further comprises a second edge and said first edge and said second edge are
- 3 adapted to substantially abut in said second configuration.

- 1 14. A device of claim 12, wherein said first surface and said second surface are disposed
2 substantially parallel to each other and overlap at least in part when placed in said second
3 configuration and said second surface comprises a bullet resistant material.
- 1 15. A device of claim 7, further comprising a handle.
- 1 16. A device of claim 7, wherein said first surface further comprises a functional surface to
2 shroud said bullet resistant material.
- 1 17. A device of claim 16, wherein said functional surface is selected from the group consisting
2 of: a wood veneer, an engineered veneer, a molded plastic, a ceramic, a fabric, and a glass.
- 1 18. A method comprising:
2 utilizing a furniture article in a first operational mode, wherein said first operational mode
3 is selected from the group comprising: chair, bench, table, or desk;
4 converting said furniture article to a second operational mode;
5 disposing a surface of said furniture article in said second operational mode toward the
6 direction of a threat, wherein said surface is comprised of a bullet resistant material, and
7 detaching a portion of a support from said furniture article wherein said support is affixed
8 to said furniture article and said portion is adapted to be wielded by a human as a
9 weapon.
- 1 19. The method of claim 18, further comprising holding said furniture article in said second
2 operational mode via a handle affixed to said furniture article.
- 1 20. The method of claim 18, further comprising observing said threat by looking through an
2 aperture disposed within said surface.

ABSTRACT

A bullet resistant article and method for using the same is presented. The bullet resistant article is adapted for use by a human and possesses a surface, such as a seat bottom, seat back, table or bench surface formed from a bullet resistant material. The article has a support, such as a leg, that is coupled to the surface and provides support for the surface. The article is adapted to allow a human to grasp the article and dispose the bullet resistant surface toward a threat to minimize the likelihood of injury from the threat. In one aspect a portion of the support is removable and is suitable for use by the human as a weapon.