ABSTRACT

Shooting targets, including teaching targets, target assemblies and associated systems are disclosed herein. One aspect of the disclosure is directed to target systems and assemblies for effectively teaching and practicing shot placement on animal shapes for improving hunting skills. In a particular embodiment, a shooting target assembly includes a backer having at least a first target image. The backer may include a substrate and a first print layer. The target image, including at least a first animal shape, may be at least partially defined by the first print layer. The assembly may also include a replacement label sized to cover a target region of the first target image. The replacement label may include a label print layer that at least partially defines a region of the animal shape. The replacement label may also include an illustration of a first organ structure.
Fig. 7
SHOOTING TARGETS, INCLUDING TEACHING TARGETS, TARGET ASSEMBLIES AND ASSOCIATED SYSTEMS

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims priority to U.S. Provisional Patent Application No. 60/840,754, filed Aug. 28, 2006, entitled “FIREARM TARGET ASSEMBLIES,” and which is incorporated by reference herein.

TECHNICAL FIELD

[0002] The present disclosure is directed generally to shooting target assemblies and shooting target systems, including targets with replacement target regions configured to improve and teach shot placement skills.

BACKGROUND

[0003] Many marksmen use firearms, including game hunters, competitive and non-competitive sport shooters, military personnel, law enforcement officers, as well as ranchers needing to protect livestock from predators. At some point in their training, most marksmen use firearm targets to improve and practice their marksmanship skills. Similarly, hunting archers or sports archers, also uses targets to improve accuracy and precision. Typically, target practice occurs on a shooting range or on a protected environment suitable for repeat practice and evaluation of performance.

[0004] Conventional targets may include a variety of images, typically fashioned to include progressively smaller concentric portions culminating in a desired point of impact such as a “bull’s-eye,” for a firearm projectile (e.g., a bullet) or arrow. Target images for marksmanship practice may be a variety of sizes and may be used for practice while positioned at various distances and in a variety of environmental conditions (e.g., bright or low lighting, precipitation, wind, etc.). For example, targets used in varying outdoor conditions or at great distances may have other features (e.g., color, texture, reflectivity, water resistance, glare resistance, positional at various heights, etc.).

[0005] Target shooting may help marksmen measure and track their shooting accuracy. For example, the distance between the intended impact point and the actual impact point can be measured and recorded to monitor improvement in target shooting accuracy. While sport shooting competitions typically include targets having an intended impact point, in some instances (e.g., hunting) marksmen must hit desired impact points while not having indication marks such as a bull’s-eye to guide their sight lines. Accordingly, targets and target assemblies are important elements in teaching, practicing, and improving marksman-related skills.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] In the drawings, identical reference numbers identify similar elements or acts. The sizes and relative positions of elements in the drawings are not necessarily drawn to scale. For example, the shapes of various elements and angles are not drawn to scale, and some of these elements are arbitrarily enlarged and positioned to improve drawing legibility. Further, the particular shapes of the elements as drawn are not intended to convey any information regarding the actual shape of the particular elements, and have been solely selected for ease of recognition in the drawings.

[0007] FIG. 1A is a front view illustration of a shooting target assembly in accordance with an embodiment of the disclosure.

[0008] FIG. 1B is a front view illustration of a target backer in accordance with an embodiment of the disclosure.

[0009] FIGS. 2A-2C are cross-sectional views along line 2-2 in FIG. 1B of embodiments of the target backer in accordance with an embodiment of the disclosure.

[0010] FIGS. 3A-3D are partially schematic, front view illustrations of embodiments of a replacement label in accordance with an embodiment of the disclosure.

[0011] FIG. 4A is a partially schematic, front view illustration of a shooting target assembly having an animal shape in a front perspective view, in accordance with an embodiment of the disclosure.

[0012] FIG. 4B is a partially schematic, front view illustration of a shooting target assembly having an animal shape in a broadside perspective view, and in accordance with an embodiment of the disclosure.

[0013] FIG. 5 is a partially schematic, top perspective view illustration of an embodiment of a shooting target system in accordance with the disclosure.

[0014] FIG. 6 is a partially schematic, front view illustration of another shooting target assembly in accordance with an embodiment of the disclosure.

[0015] FIG. 7 is a partially schematic, front view illustration of another shooting target assembly in accordance with an embodiment of the disclosure.

[0016] FIG. 8 is a partially schematic, front view illustration of another shooting target assembly in accordance with an embodiment of the disclosure.

[0017] FIG. 9 is a partially schematic, front perspective view illustration of a further embodiment of a shooting target assembly in accordance with the disclosure.

DETAILED DESCRIPTION

A. Overview

[0018] The following disclosure describes several embodiments of shooting targets, target assemblies, and associated systems and methods. One aspect of the disclosure is directed to shooting targets having a replaceable target region for improving and teaching shot placement.

[0019] In one embodiment, a shooting target assembly includes a backer having at least a first target image. The backer may include a substrate and a first print layer. The target image, including at least a first animal shape, may be at least partially defined by the first print layer. The assembly may also include a replacement label sized to cover a target region of the first target image. The replacement label may include a label print layer that at least partially depicts an internal region of the animal. For example, the replacement label may include an illustration of a first organ structure.

[0020] In another embodiment, a shooting target system includes a target assembly having a target backer with a first target image on a first side and a second target image on a
second side. The first target image has a first animal shape with a first target region and the second target image has a second animal shape with a second target region. The target assembly may also include a first replacement label including a first region on a front surface corresponding to one of the first or second target regions. The target assembly may also include an illustration of an internal organ structure overlaying at least one of the first animal shape, the second animal shape, and/or the first region.

Another embodiment is directed to shooting target assemblies having a target backer with a photorealistic image presented on a first side of the target backer. The photorealistic image may include an animal image. The shooting target assembly also includes a replacement label. The replacement label includes a portion of the animal image contained on the target backer and is positioned on the target backer such that the animal image and the photorealistic image are substantially aligned. The portion of the animal image contained on the replacement label may be photorealistic. The portion of the animal image may further include a schematic view of a region of the animal. The shooting target assembly also includes an illustration of an internal organ structure carried by the replacement label.

Specific details of several embodiments of the disclosure are described below with reference to shooting targets and shooting target assemblies. Several details describing well-known structures or processes often associated with targets and manufacturing of targets are not set forth in the following description for purposes of brevity and clarity. Also, several other embodiments of the disclosure may have different configurations, components, or procedures than those described in this section. A person of ordinary skill in the art, therefore, will accordingly understand that the disclosure may include other embodiments with additional features and characteristics, or the disclosure may include other embodiments without several of the features and characteristics shown and described below with reference to FIGS. 1A-9.

Where the context permits, singular or plural terms may also include the plural or singular term, respectively. Moreover, unless the word "or" is expressly limited to mean only one single item exclusive from other items in reference to a list of at least two items, then the use of "or" in such a list is to be interpreted as including (a) any single item in the list, (b) all of the items in the list, or (c) any combination of the items in the list. Additionally, the term "comprising" is used throughout to mean including at least the recited feature(s) such that any greater number of the same features and/or other types of features and components are not precluded.

B. Embodiments of Target Assemblies

FIG. 1A is a front view of a shooting target assembly 100 for teaching and practicing shot placement by a practice shooter (e.g., a firearm marksman, archer) in accordance with one embodiment of the disclosure. The shooting target assembly 100 includes a target backer 110 having a substrate 112 and a first print layer 114. The first print layer 114 may be partially defined by a target image 120. The target image 120 may include at least an animal shape 122. The assembly 100 may further include a replacement label 130 sized to cover a target region 124 of the target image 120 and having a label print layer 132 at least partially defining a region 125 of the animal shape 122. The label print layer 132 may include an illustration of internal organ structures 134a-134d (collectively referred to as 134), such as vital organs (e.g., lungs, heart, liver, spine, etc.). In other embodiments, the label print layer 132 may include a bull's-eye, or may match the animal shape 122 of the target region 124 that is being covered.

FIG. 1B is a front view of the target backer 110 illustrated in FIG. 1A. Referring to FIGS. 1A and 1B together, the target backer 110 has the first print layer 114 (e.g., an ink layer, a laser-printed surface, a painted surface, a printed photographic image, etc.) covering or at least proximal to the substrate 112 and facing in a direction generally opposite from the substrate 112 and visible by the shooter. The first print layer 114 may at least partially define the target image 120. In some embodiments, the first print layer 114 may include one or more colors arranged in a color pattern to form the target image 120. In other embodiments the first print layer 114 may be a photograph or other photorealistic image of an animal shape 122 or other target shape.

As illustrated in the embodiment shown in FIG. 1B, the target image 120 may include a simulated image of a game animal or hunting target such as the animal shape 122. The animal shape 122 illustrated in FIGS. 1A and 1B depicts a buck as the animal would be visualized from a broadside perspective view 129. One of ordinary skill in the art will recognize that a variety of animal shapes, including animal shapes depicted in a wide array of positions (e.g., perspective views, front views, top views, rear views), may be shown including, but not limited to, game animals (e.g., deer, moose, elk), birds (e.g., wild turkey, duck, quail), canid family members (e.g., coyote, fox), felines (e.g., mountain lion), and vermin (e.g., ground squirrel, mole, rabbit, gopher). The animal shape 122 may be sized to full-scale or may be less or more than full-scale. Accordingly, the animal shape 122 representing a buck may be sized according to the buck's authentic size on the target image 120. In other embodiments, the target image 120 may have the animal shape 122 sized differently than full-scale (e.g., smaller or larger than the animal's authentic size).

The animal shape 122 may be colored and have characteristic features 123 that impart a recognizable and/or realistic appearance. In this specific embodiment, the animal shape 122 may be a photograph taken of the desired target representative animal. In other embodiments, a realistic illustration or painting may depict the animal shape 122, the representative animal color, and/or characteristic features 123. In further embodiments, the animal shape 122 may be a simple drawing or cartoon that includes characteristic features 123 of the representative animal, target or target shape.

As illustrated in FIG. 1B, the target image 120 may include one or more illustrations of the internal organ structures 134 (e.g., heart, lungs, liver, spine, other skeletal features, etc.) at least partially defined by the first print layer 114. In some embodiments, the replacement label 130 may include the internal organ structures 134 and is configured to overlay the animal shape 122 in a generally anatomically correct position. Additionally, the internal organ structures 134 may be scaled to size according to the corresponding size of the animal shape 122. Furthermore, the internal organ structures 134 may include the anatomical shape of the
representative organs' structures. In other arrangements, the anatomical shape may not be included and the illustrations may include other shapes such as a bull’s-eye to represent the location of the representative organ structures. Some illustrations of the internal organ structures 134 (e.g., illustrations representing vital organ structures) may generally be located in the target region 124 (shown in dotted lines) of the target image 120.

[0029] In one embodiment, the illustrations of the internal organ structures 134 may include an outline of the one or more internal organ structures. In some arrangements, the outline may be in a lighter color (e.g., gray, light brown, etc.) so that the outlines of the internal organ structures 134 do not contrast with the animal shape 122, including the internal coloring of the animal shape 122. Consequently, the internal organ structures 134 may be at least partially camouflaged by the animal shape 122 and color and may have a general “phantom” appearance. In other arrangements, the illustrations of the internal organ structures 134 may be outlined in a contrasting color, or in other arrangements, the internal organ structures 134 may be filled with a pattern or solid color (e.g., red, pink, yellow, green, grey, etc.). In a further embodiment, the illustrations of the internal organ structures 134 may include identification information 135, such as a identification label to indicate the name of the representative organ. In some embodiments, the first print layer may not include the internal organ structures 134.

[0030] In one embodiment, the animal shape 122 may be surrounded by an exterior image region 126. The exterior image region 126 may include shapes depicting realistic surroundings for the representative animal. For example, the exterior image region 126 may include environmental features 127 such as grass, bushes, trees, clouds, mountain sides, rocks, or other natural features. The environmental features 127 may be colored, shaped, and otherwise emulate a natural setting via a photographic image (e.g., photorealistic image), an illustration, a painting or the like. The target image 120, including the animal shape 122 and the exterior image region 126, may have a generally natural appearance that a hunter or other marksman (e.g., forest ranger, rancher, law enforcement officer) would realistically encounter while hunting or while on the job.

[0031] In other embodiments, the target image 120 may not include the environmental features 127. For example, the exterior image region may be a solid color and/or have other target features such as conventional target shapes 128 having concentric rings (e.g., bull’s-eye), cross-hairs, etc. In these embodiments, shooters may practice shooting the conventional target shapes 128 and/or use the conventional target shapes 128 for focusing scopes, laser pointers, night vision equipment and the like. In a particular arrangement, the target image 120 may include manufacturing and/or company identification information (not shown). In some embodiments, the target backer 110 may be cut to remove the exterior image region 126 or shaped to include only the animal shape 122.

[0032] FIGS. 2A-2C are partially schematic, cross-sectional views illustrating embodiments of the target backer 110 (individually illustrated as 110a-c) in accordance with the present disclosure. Referring to FIGS. 2A-2C, the target backer 110 may be generally planar and have a first side 202 and a second side 204 facing opposite from the first side 202. In other embodiments, the target backer 110 may have other configurations (e.g., curved, three-dimensional, folded, etc.) The target backer 110 may include the substrate 112 having at least a core layer 206. In some embodiments the target backer 110 may also include a texture layer (not shown) that would lend to the appearance of a three-dimensional structure.

[0033] FIG. 2A illustrates an embodiment of the target backer 110a wherein the core layer 206 includes a rigid or semi-rigid layer having a corrugated shape. The core layer 206 may be made of a variety of materials including cardboard, plastic, paper stock, or other suitable supporting material. As illustrated in FIG. 2A, the substrate 112 may also include one or more additional support layers 208a and 208b attached to the core layer 206 on the first and second sides 202 and 204, respectively. Support layers 208a and 208b may be formed from the same material as the supporting material used to form the core layer 206 or the support layers 208a and 208b may be formed of a material different than the support material used for forming the core layer 206.

[0034] In one embodiment, the first side 202 includes the first print layer 114 wherein the first print layer at least partially defines a first target image (e.g., the target image 120 shown in FIG. 1B). The first print layer 114 may be printed on a sheet of paper, plastic, or other printable material, and may be permanently or temporarily attached to the support layer 208a with an adhesive (not shown) such as an adhesive film, epoxy, tape, paste, or other suitable material. Additional embodiments may include attaching the first print layer 114 to the support layer 208a with tacks, clips, nails, staples, or other fastening devices.

[0035] Referring to FIG. 2A, the second side 204 may include a second print layer 210. The second print layer 210 may have several of the same features as the first print layer 114. For example, the second print layer 210 may at least partially define a second target image (not shown). The second target image may be the same as the first target image 120; may show the first target image from a different perspective; or may be different from the first target image. In a specific example, the first target image may include a first animal shape (e.g., animal shape 122) and the second target image may include a second animal shape different from the first animal shape.

[0036] In another embodiment, illustrated in FIG. 2B, the target backer 110b includes the substrate 112 having the core layer 206 as described above with respect to target backer 110a (FIG. 2A). The target backer 110b differs from the target backer 110a in that the target backer 110b does not include the additional support members 208a and 208b. In this embodiment, the first print layer 114 and/or the second print layer 210 may be directly attached to the core layer 206. In another embodiment, not shown, the substrate 112 may include at least one of the additional support members 208a or 208b (FIG. 2A) and at least one of the first print layer 114 or the second print layer 210 may be directly applied to (e.g., printed onto) the support layer 208a or 208b. In other embodiments, the first print layer 114 may be directly applied to the core layer 206 on a first side and the support layers 208a and/or 208b can be attached to a second side.
FIG. 2C is a cross-sectional view along line 2-2 of FIG. 1B illustrating a target backer 110c in accordance with another embodiment of the disclosure. The target backer 110c differs from the target backers 110a and 110b in that the target backer 110c has a planar core layer 206. The core layer 206 may be a solid material that generally provides mechanical strength and support for the target backer 110c (e.g., a plastic structure, polystyrene layer, cardboard, wood, or other supporting material). In the embodiment illustrated in FIG. 2C, the first print layer 114 and/or the second print layer 210 may be attached to the core layer 206. In other arrangements, the additional support layers 208a and 208b (FIG. 2A) may be attached to the core layer 206 and the first print layer 114 and/or the second print layer 210 may be directly applied to (e.g., printed onto) the support layer 208a and/or 208b. The embodiments of the target backer 110a-c illustrated in FIGS. 2A-2C, contain the substrate 112 having supportive features, such as the core layer 206. The target assembly may also include a target stand (not shown) configured to carry the target backer 110 in a variety of locations and position the target backer at various angles. For example, the target stand may be configured to carry the target backer 110 in a plane transverse to the horizon (e.g., vertical, upright). In another embodiment, the target stand may support at least the target backer in a position that is generally parallel to the horizon. The target stand may include a variety of support members for carrying the target backer 110. In some arrangements, the target backer 110 may not include a core layer 206 and the target backer 110 may be fully supported by the target stand. In other arrangements, the target stand may be unnecessary and the target backer 110 may be configured to be self-supporting (e.g., by folding, an integrated back support, etc.) or supported by other structures (e.g., a fence, a box, a hay bale, the ground, etc.).

Referring back to FIG. 1A, the shooting target assembly 100 also includes the replacement label 130. The replacement label 130 may be generally planar and may include one or more pliable or non-pliable layers. For example, the replacement label 130 may include a label substrate 131, such as paper stock or plastic, and the label print layer 132 covering the label substrate 131. The replacement label 130 may have a front surface 133 and a back surface (not shown) generally facing opposite from the front surface 133. The label print layer 132 may be applied to or otherwise attached to the front surface 133.

The replacement label 130 may have a size smaller than the target backer 110. For example, the replacement label 130 may be configured to cover a portion of the target image 120 (e.g., the target region 124) on the target backer 110. In one embodiment, the region 125 of the animal shape 122, as defined by the label print layer 132, may correspond to the target region 124 of the target image 120. The label print layer 132 may at least partially define the region 125 such that the region 125 is a duplicate image of the corresponding target region 124. For example, the region 125 of the replacement label 130 may be duplicated in color and design such that when the replacement label is attached to the target region 124 of the target image 120, the visual transition between the target image 120 and the region 125 defined by the label print layer 132 is seamless. In other embodiments, however, the region 125 may look different from the target image surrounding the target region 124.

In one embodiment, the label print layer 132 may also at least partially define one or more of the illustrations of the internal organ structures 134. In this arrangement, the region 125 may be different from the target region 124. For example, in embodiments wherein the target image 120 does not include one or more of the internal organ structures 134, a replacement label 130 having one or more of the internal organ structures 134 may be attached to target backer 110 thereby changing the appearance of the target assembly 100. In other embodiments, differing internal organ structures 134 may be shown on each of the target image 120 and the replacement label 130, e.g., lungs 134a, heart 134b, liver 134c, spine 134d, etc.

FIGS. 3A-3D are partially schematic, cross-sectional views illustrating embodiments of the replacement label 130 (individually illustrated as 130a-c) in accordance with the present disclosure. The replacement labels 130 are substantially as described above with respect to FIG. 1A. The replacement labels 130a-130c differ from each other by including more or less target practice information overlaying the region 125. For example, FIG. 3A illustrates an embodiment of the replacement label 130a having the label substrate 131 and the label print layer 132. In this embodiment, the label print layer 132 at least partially defines the region 125 and the illustrations of internal organ structures 134a-c. The illustrations of the internal organ structures 134a-c may be configured to overlay the region 125 and may include only an outline of the internal organ structures 134a-c. As described above, the outline of the internal organ structures 134a-c may be in a non-contrasting color (e.g., grey, brown, etc.) to minimize visibility of the internal organ structures 134a-c to the practicing shooter (not shown). In other arrangements, the outline of the internal organ structures 134a-c may be in a contrasting color (e.g., white, black, red, etc.) from the surround color of the region 125 such that the outline has increased visibility for the practicing shooter.

In another embodiment, illustrated in FIG. 3B, the replacement label 130b may include the label print layer 132 having illustrations of the internal organ structure 134a-c that are fully patterned or color-filled such that the internal organ structures 134a-c are fully visible to the practicing shooter (not shown) when overlaying the region 125. For example, the lungs 134a could be colored pink, the heart 134b could be colored red and the liver 134c could be colored blue. In other arrangements, the internal organ structures 134a-c could include other colors or patterns (cross-hatching, etc.).

Referring to FIG. 3C, the replacement label 130c may include an additional target feature, such as concentric rings 136 overlaying a portion of the internal organ structures 134a-c. In this embodiment, the concentric rings 136 may provide information to the practicing shooter about where to aim the intended shot. For example, the heart 134b may be at the center of the concentric ring design such that the practicing shooter learns where to place his/her shot when hunting. The concentric rings 136 may be placed in other locations within the region 125 depending on the intended skill to practice (e.g., shooting tranquillizers darts). In the illustrated embodiment, the replacement label 130 includes both the internal organ structures 134a-c having...
filled color and the concentric rings 136. However, one of ordinary skill in the art will appreciate that other replacement labels 130 may have other arrangements useful for target practice. For example, the replacement label 130 may include the concentric rings 136 configured to overlay the outlines of the internal organ structures 134a-c shown in FIG. 3A. In another arrangement, the replacement label 130 may include the concentric rings 136 and not include the internal organ structures 134a-c. In this arrangement, the concentric rings 136 overlay the region 125 directly.

[0045] Referring to FIGS. 3A-3C together, the replacement label 130 may have the label print layer 132 at the front surface 133. In some embodiments, the replacement label 130 may include a second label print layer (not shown) at the back surface. For example, the replacement label 130 may be configured to be dual-sided. In these particular embodiments, the second label print layer may have many of the same features and characteristics as described with respect to the label print layer 132. In one embodiment, both the label print layer 132 and the second label print layer may be configured to cover the target region 124. In a particular example, the label print layer 132 may include the elements illustrated in the replacement label 130 of FIG. 3A, and the second label print layer may include the elements illustrated in the replacement labels 130b or 130c (FIGS. 3B-3C). In these embodiments, the region 125 is at least partially defined by both the label print layer 132 at the front surface 133 and the second label print layer at the back surface. Accordingly, the practice shooter (not shown) may determine if the practice session will include the elements depicted on the front surface 133 or the elements depicted on the back surface (not shown) by selectively attaching one of the front surface 133 or the back surface to the target backer 110.

[0046] In other embodiments, the second label print layer may be different from the label print layer 132, in that a second region (not shown), at least partially defined by the second label print layer, may be different from the region 125. For example, the back surface of the replacement label 130 may be configured to be attached to a target backer 110 having a different target image (e.g., a second target image including at least a second animal shape). In this embodiment, the practice shooter may choose to use the replacement label 130 on more than one target backer 110 for a practice shooting round. While a dual-sided replacement label 130 may provide additional practice elements not provided by a single-sided replacement label 130 (e.g., more or less shot placement information for guiding and/or teaching the shooter where to place practice shots), the replacement label 130 may be destroyed during the practice round. Therefore, the practice shooter will likely use only one of the front surface 133 or the back surface of the replacement label 130.

[0047] In a further embodiment illustrated in FIG. 3D, the replacement label 130 may be configured for testing a practice shooter’s skill level during a practice shooting round. For example, the replacement label 130 may be the dual-sided replacement label 130 having both the label print layer 132 at the front surface 133 and the second label print layer 302 at the back surface 304. In one embodiment, the label print layer 132 may at least partially define the region 125, but not include the illustrations of the internal organ structures 134 or other target elements (e.g., concentric rings 136). The second label print layer 302 at the back surface 304 may include at least the illustrations of the internal organ structures 134 (shown in dotted lines) in generally anatomically correct positions. In use, the back surface 304 may be attached to the target backer 110, such that the internal organ structures 134 are concealed from view. The practice shooter may shoot a plurality of projectiles (e.g., bullets, arrows) at the front surface 133 during a practice round to test his/her shot placement skills. Following at least one practice shot, the shooter may gauge shot placement success by comparing the projectile entry site (e.g., bullet hole) with the internal organ structure 134 on the back surface 304. In other embodiments, the second label print layer 302 may have more or less skill testing information. For example, the second label print layer 302 may also include a mirror image of the internal area 125, concentric circles 136, measuring and/or other accuracy determining features.

[0048] In another embodiment, not shown, the replacement label 130 may have the label print layer 132 at the front surface 133. As described above with respect to FIG. 3D, the label print layer 132 may at least partially define the region 125, but not include the illustrations of the internal organ structures 134 or other target elements (e.g., concentric rings 136). In these embodiments, the assembly 100 may be provided with removable organ structures that may be independently attached to the region 125 when desired. For example, the removable organ structures may be stickers that are applied to the front surface 133. Orientation markers may be provided to guide the placement of the stickers, etc. In these embodiments, the practice shooter may have the opportunity to selectively choose which organ structures to be presented (e.g., illustration of the heart 134b) on the replacement label 130.

[0049] Referring back to FIGS. 3A-3D, the replacement label 130 may be configured to have an adhesive at the back surface (not shown) facing opposite from the front surface 133. The adhesive may be an integral layer applied to the back surface (e.g., adhesive film, epoxy, tape, paste, or other suitable material). Additional embodiments may include attaching the replacement label 130 to the target backer 110 with tacks, clips, nails, staples, or other fastening devices. In these embodiments, the back surface (e.g., back surface 304) does not require adhesive application.

[0050] The adhesive (not shown) may be configured to releasably attach the replacement label 130 to the target backer 110 such that the replacement label 130 may be used for a shooting practice session and subsequently be removed from the target backer 110. For example, a marksman using a firearm (not shown) may shoot a plurality of firearm projectiles (e.g., bullets) aimed to hit the replacement label 130, creating a plurality of projectile holes 140a-c (referred together as 140) in the replacement label 130 as well as in the target backer 110. Following impact of the projectiles at the front surface 133 and/or the first side 202, the holes 140a-c disposed in the replacement label 130 and the corresponding portion of the target backer 110 may be patched by removing the replacement label 130 and attaching a second replacement label 130 configured to cover the target region 124 of the target image 120. The second replacement label 130 may also be releasably attached to the target backer 110. By using a plurality of replacement
labels 130, the target backer 110 may be used in several subsequent practice shooting rounds.

[0051] In some embodiments, the replacement labels 130 may be configured to release from the target backer 110 without further damage to the replacement label 130, such that the practice shooter may score and/or keep the replacement label 130 for his or her records. In other embodiments, the adhesive may be configured to permanently attach the replacement label 130 to the target backer 110. In these embodiments, the second replacement label 130 may be configured to cover the target region 124 and the first replacement label 130 having the holes 140.

[0052] In some embodiments, the target backer 110 and/or the replacement label may include additional visibility features for assisting practice shooters in determining points of impact during a practice round. Referring back to FIG. 1A, the first print layer 114 may include a release feature that allows a portion 141 of the first print layer 114 adjacent to a point of impact 142a-b to be removed. One of ordinary skill in the art will recognize suitable materials having release features, e.g., crackled or flake-off printed or painted materials, having semi-elastic properties, a separate release layer and/or a synthetic layer (not shown) between the substrate 112 and the first print layer 114, etc. Additional embodiments and description of suitable targets having flake-off and/or release features associated with print layers are disclosed in U.S. patent application Ser. No. 11/339,863, entitled “FIREARM TARGETS AND METHODS FOR MANUFACTURING FIREARM TARGETS,” which is incorporated herein in its entirety by reference.

[0053] In one embodiment, a first contrasting surface 143 may be exposed through the first print layer 114 following projectile impact. The first contrasting surface 143 may be a layer between the substrate 112 and the first print layer 114. In one embodiment, the first contrasting surface 143 may be the support layers 208a and 208b (FIG. 2A). In other embodiments, the first contrasting surface 143 may be the core layer 206 (FIGS. 2A-2C). The first contrasting surface 143 may have a first color 144a that aligns at least with the animal shape 122. For example, the first color 144a may be a contrasting color, such as red, orange, white, or other suitable color, that visually stands out to the practice shooter once the first contrasting surface 143 is exposed. Specifically, when a projectile (e.g., bullet) penetrates the target backer 110 at the point of impact 142a, the first color 144a may be exposed.

[0054] In some embodiments, the first contrasting surface 143 may also have a second color 144b that aligns at least with the exterior image portion 126. In these embodiments, the practice shooter may effectively differentiate between points of impact 142a at the animal shape 122 from points of impact 142b at the exterior image portion 126.

[0055] In other embodiments, the label print layer 132 may also include the release feature that allows a portion 145 of the label print layer 132 adjacent to a point of impact 142c to be removed. As described above with respect to the first contrasting surface 143, a second contrasting surface 146 may be exposed through the label print layer 132. In one embodiment, the second contrasting surface 146 may be the label substrate 131; however, in other embodiments, the second contrasting surface 146 may include other layers between the label substrate 131 and the label print layer 132. The second contrasting surface 146 may have a third contrasting color 144c that aligns at least with the illustrations of the internal organ structures 134. In these embodiments, the practice shooter may effectively differentiate between points of impact 142c at the internal organ structures 134 and other points of impact 142a-b.

[0056] The target image 120 and/or the target backer 110 may include one or more orientation markers 150 for properly aligning the replacement label 130 to the target backer 110 before attaching the replacement label 130. Proper alignment of the replacement label 130 facilitates the anatomically correct positioning of the illustrations of the internal organ structures 134. In other embodiments, alignment markers 150 are not necessary and features of the animal shape 122 and/or environmental features may serve as an alignment guide when attaching the replacement label 130 to the target backer 110.

[0057] Recognition of animal shapes 122 as well as learning and practicing shooting skills for successfully targeting the anatomically correct positions of vital organs, will provide greater success for hitting the vital organ structures in living animals. Accordingly, animal pain and suffering may be reduced in hunting and/or extermination events. Existent targets typically do not include a simulation of authentic shooting conditions or a plurality of teaching elements for learning and practicing shot placement relative to an animal shape. For example, conventional targets typically do not include photo-quality images that would teach a new hunter what a representative animal would look like during a hunt. Additionally, conventional targets do not typically feature animal shapes at a full-scale size, which may further instruct shot placement by encouraging practice shooters to be aware of the correct anatomical positioning of the vital organs. Furthermore, these targets do not have replaceable features that permit the practice shooter to use the target during multiple practice sessions or permit choosing varying degrees of difficulty to learn and test shot placement skills.

[0058] In contrast to conventional targets, the shooting target assembly 100 may provide a teaching system for shot placement and awareness of organ structure positions relative to the animal shape 122 or other characteristic features 123, enabling shooters to acquire skills for shot placement when hunting or shooting live animals. For example, the target image 120 may include a photo-realistic image of a representative animal (e.g., animal shape 122) with or without the exterior image region 126 depicting realistic surroundings for the representative animal. Additionally, the shooting target assembly 100 may present the animal shape 122 at a realistic full-scale size.

[0059] In a particular embodiment, the shooting target assemblies 100 may be manufactured such that multiple replacement labels 130 having a variety of arrangements may be used with a single target backer 110. Each of the replacement labels 130 may provide a teaching, practice, and/or testing session for the practice shooter. Use of the target backer 110 in multiple practice rounds may be facilitated by covering the target region 124 with additional replacement labels 130 between successive rounds. The replacement labels 130 do not require the same quantity of manufacturing time or material to produce as do the target backers 110, and therefore may be significantly less expen-
sive to produce. Accordingly, the reuse of the target backer 110 may provide cost savings to the practice shooter and/or range operator.

Furthermore, the combination of the target backer 110 and the replacement labels 130 provides means to present multiple sets of information, e.g., first and second sides 202 and 204 of the target backer 110, front surfaces 133 and back surfaces (not shown) of replacement labels 130, and/or combinations of target features (e.g., bone structure, internal organ structures, crosshairs, and/or concentric circles).

Another feature of particular embodiments of the shooting target assembly 100 is that varying degrees of shooting difficulty and/or shot placement difficulty may be selected by the practice shooter at each individual practice round. In a specific example, the practice shooter may begin a first practice round using the replacement label 130c (FIG. 3C) configured to teach the practice shooter where to aim in order to properly strike vital organs in the target animal. Following the first practice round, the practice shooter may have one or more practice rounds using replacement labels 130a and/or 130b (FIG. 3A-3B). Additionally, the practice shooter may test and evaluate their shot placement skills using the dual-sided replacement label 130d (FIG. 3D) having the region 125 on a front surface 133 exposed to the shooter and the illustrations of the internal organ structures 134 on the back surface 304 facing the target backer 110.

The highlighted features, and other related features disclosed herein, provide the opportunity to form a target assembly system that may be manufactured and sold as a kit. For example, the kit may provide a teaching, practicing, and/or testing system. The kit may include one or more target backers 110 having one or more target images 120. Additionally, the kit may include a plurality of replacement labels 130. In one embodiment, the kit may include one or more of each of the replacement labels 130a-d. One of ordinary skill in the art will recognize other elements that could be beneficially included in the kit (e.g., a target stand, a record keeping notebook, etc.). In other embodiments, the shooting target assembly elements could be sold as separate units.

C. Additional Embodiments of Targets and Target Assemblies

FIGS. 4A-8 illustrate additional embodiments of shooting target assemblies in accordance with the present disclosure. The shooting target assemblies illustrated, and described in more detail below, are generally similar to the shooting target assembly 100 described with respect to FIGS. 1A-3A. However, the shooting target assemblies illustrated in FIGS. 4A-8 include different target images 120 having the animal shape 122 representing a) different perspectives of an animal body that may be presented to a practice shooter, or b) different animals that may be hunted and/or exterminated.

FIGS. 4A and 4B are partially schematic, front view illustrations of shooting target assemblies 402 and 404, respectively. The shooting target assemblies 402 and 404 include several of the same features as the shooting target assembly 100 illustrated in FIG. 1A. For example, the shooting target assembly 402 illustrated in FIG. 4A includes the target backer 110 and the replacement label 130. The target backer 110 includes a target image 406 different from the target image 120 illustrated in FIG. 1. The target image 406 may be at least partially defined by the first print layer 114 and may include a first animal shape 408. Similar to the animal shape 122 presented in FIG. 1A, the first animal shape 408 represents the back. However, the first animal shape 408 represents a front view perspective 410 of the buck's body. In this embodiment, the replacement label 130 may be configured to include a region 412, and in some embodiments, illustrations of internal organ structures 414 in anatomically correct shapes and positions consistent for the front view perspective 410 of the first animal shape 408. Accordingly, a practice shooter may learn and practice shot placement and develop organ position awareness for an animal discovered in the front perspective orientation in the wild.

FIG. 4B illustrates the shooting target assembly 404 including the target backer 110 and the replacement label 130. The target backer 110 includes a target image 420 different from the target images 120 and 406. The target image 420 includes a second broadside view perspective 422 of an animal shape 424 (e.g., the buck). In this particular example, the second broadside view perspective 422 is the mirror image of the broadside view perspective 129 shown in FIG. 1A.

One of ordinary skill in the art will recognize other view perspectives that could be presented for a variety of animal shapes. For example, a rear view perspective, top view perspective, and bottom view perspectives could also be presented for an animal shape (e.g., a buck). In a specific example, FIG. 5 is a partially schematic, top perspective view illustration of an embodiment of a shooting target system 500 in accordance with the present disclosure. The shooting target system 500 includes a target image 502 having an animal shape 503 (e.g., buck) in a top view perspective 504. The target image 502 may be defined substantially as described above with respect to the target image 120 (FIG. 1), and may be carried by the target backer 110.

The shooting target system 500 may also include the replacement label 130, which may carry at least a region 505 as defined by the label print layer 506. In some embodiments, the label print layer 506 may also include illustrations of internal organ structures 508 (e.g., skeletal features, lungs, etc.) at or near the forequarter region (e.g., the vital organ region) of the animal shape 503 for teaching and practicing shot placement when a practice shooter 510 is shooting from an elevated position 512. It may be common for hunters to wait from the elevated position 512 (e.g., a tree, pole, or other elevated loft) for a game animal to pass underneath the position 512. In these scenarios, the hunter is presented with the top view perspective 504 of the game animal. The shooting target assembly 500 provides a practice scenario for shooters 510 to learn shot placement from the elevated position 512.

Referring to FIG. 5, the shooting target system 500 may also include a target stand 514 for supporting at least the target backer 110 in a position that is generally parallel to the horizon, parallel to the ground, transverse to a projectile path 516, or other desired position. Additionally, the stand may raise the target backer 110 a distance D1 from the ground or other support surface. The distance D1, for example, may be
generally similar to the typical height of the representative game animal or other animal; however, the distance $D$ may include other heights desirable for practice shooting rounds. In particular embodiments, not shown, the shooting target system $500$ may also include an arrow-stopping material (e.g., hay bale, polystyrene, foam rubber, etc.) positioned below the target backer $110$ and in the space created by the distance $D$, such that arrows, spears, and the like may be used during the target practice round, but remain undamaged.

[0069] FIGS. 6-8 are partially schematic, front view illustrations of additional shooting target assemblies in accordance with the present disclosure. For example, FIGS. 6-8 include shooting target assemblies $600$, $700$, and $800$ having different target images $602$, $702$, and $802$, including animal shapes $604$, $704$, and $804$ representing different animals. FIG. 6 illustrates the shooting target assembly $600$ having the target image $602$ carried at least partially by the target backer $110$. The target image $602$ includes the animal shape $604$. In the illustrated embodiment, the animal shape $604$ represents a gopher. The assembly $600$ also includes the replacement label $130$. The replacement label $130$ may be attached to the target backer $110$ and cover a target region (not shown) of the target image. In this embodiment, illustrations of the internal organ structures $606$ are presented on a front surface $133$ of the replacement label $130$.

[0070] FIG. 7 illustrates the shooting target assembly $700$ having the target image $702$ carried at least partially by the target backer $110$. The target image $702$, in this embodiment, includes an animal shape $704$ configured to represent a wild turkey. The assembly $700$ may also include the replacement label $130$, which includes illustrations of internal organ structures $706$ and a plurality of concentric rings $708$ for instructing shot placement with respect to the location of the internal organ structures $706$ and/or other animal shape features.

[0071] FIG. 8 illustrates the shooting target assembly $800$ having the target image $802$ carried at least partially by the target backer $110$ and having an animal shape $804$ configured to represent a coyote. In the illustrated embodiment, the target image $802$ includes a target region $806$ at least partially containing illustrations of internal organ structures $808$. The internal organ structures $808$ may have anatomically correct positions relative to the animal shape $804$. The assembly $800$ may also include the replacement label $130$. The label print layer $132$ may at least partially define the illustrations of the internal organ structures $808$ positioned within the target region $806$. The replacement label $130$ may be attached to the target backer $110$ and aligned with the target region $806$ prior to a practice shooting round.

[0072] In one embodiment, not shown, target backers $110$ may have more than one animal shape, such as shapes $408$ and $424$ (FIGS. 4A-8), at least partially defined by the first print layer $114$ on the first side $202$. In these embodiments, the practice shooter is presented with more than one sight option during a practice shooting round. For example, more than one replacement label $130$ may be attached to the target backer $110$ and positioned to cover at least a portion of the animal shapes $408$ and $424$ during the practice shooting round.

[0073] FIG. 9 is a partially schematic, front perspective view illustration of a further embodiment of shooting target assembly $900$ in accordance with the disclosure. FIG. 9 illustrates an embodiment of a dual-sided target backer $110$ that may be similar to any of the target backers $110a-c$ shown in FIGS. 2A-C. In this embodiment, the first side $202$ may have a first target image $902$ including a first animal shape $904$ and first target region $906$ generally positioned at or near a first vital organ region (not shown). The second side $204$ may include a second target image $908$ including a second animal shape $910$ and second target region $912$ generally positioned at or near a second vital organ region.

[0074] The positions of the target regions $906$ and $912$ may be specific to the animal shapes $904$ and $910$. For example, the first animal shape $904$ may be a broadside view perspective of a buck showing the target region $906$ at or near the forequarters region of the first animal shape $904$. The second animal shape $910$ may include a front view perspective of a buck and having the target region $912$ at or near the breast of the second animal shape $910$. In other arrangements, different animal shapes, including other perspective views of animal shapes may be used.

[0075] A practice shooter may choose to shoot a practice round using either the first side $202$ or the second side $204$. Referring to FIG. 9, firearm projectiles (e.g., bullets) or arrows (not shown) may penetrate the first side $202$ and pass through the target backer $110$ leaving bullet holes $920$ visible from both the first and second sides $202$ and $204$. In the illustrated embodiment, the animal shapes $904$ and $910$ are positioned on respective sides $202$ and $204$ of the target backer $110$ such that the target regions $906$ and $912$ are aligned with each other. For example, a projectile (not shown) propagating along a projectile path $922$ aligned with the first target region $906$, will impact the first target region $906$ and pass through the second target region $912$. Accordingly, holes $920$ formed in the target backer $110$ through both target regions $906$ and $912$ may be covered with replacement labels (not shown) such that either the first target image $902$ or the second target image $908$ may be used in subsequent practice rounds. In other embodiments, the target regions $906$ and $912$ may not align with each other. In these embodiments, the holes $920$ created when shooting at either the first or second target images $902$ or $908$ may not significantly impact the appearance of the other target image.

[0076] From the foregoing, it will be appreciated that specific embodiments of the disclosure have been described herein for purposes of illustration, but that various modifications may be made without deviating from the disclosure. Furthermore, aspects of the disclosure described in the context of particular embodiments may be combined or eliminated in other embodiments. Further, while features and characteristics associated with certain embodiments of the disclosure have been described in the context of those embodiments, other embodiments may also exhibit such features and characteristics, and not all embodiments need necessarily exhibit such features and characteristics to fall within the scope of the disclosure. Accordingly, the disclosure is not limited, except as by the appended claims.

We claim:

1. A shooting target assembly, comprising:

a backer including a substrate having a first side, a second side facing opposite from the first side, and a first print layer on the first side;
a first target image at least partially defined by the first print layer, the first target image having at least a first animal shape;

a replacement label sized to cover a target region of the first target image, the replacement label having a front surface, a back surface facing opposite the front surface, and a label print layer on the front surface, wherein the second print layer at least partially defines a region of the first animal shape, and wherein the replacement label includes an illustration of a first internal organ structure; and

a release feature at least partially incorporated in the replacement label such that penetration of a projectile removes a portion of the label print layer adjacent to a point of impact and exposes a first contrasting surface adjacent to the label print layer.

2. The assembly of claim 1 wherein the first contrasting surface includes a first color aligned at least with the illustration of the first internal organ structure.

3. The assembly of claim 1 wherein the first print layer includes the release feature such that penetration of the projectile removes a portion of the first print layer adjacent to a second point of impact and exposes a second contrasting surface adjacent to the first print layer, the second contrasting surface having a second color aligned at least with the first animal shape.

4. The assembly of claim 3 wherein the target image includes an exterior image region, the exterior image region surrounding the first animal shape, and wherein the second contrasting surface includes a third color aligned with the exterior image region.

5. The assembly of claim 1 wherein the replacement label further includes an adhesive layer at the back surface for releasably attaching the replacement label to the target region of the first target image on the backer.

6. The assembly of claim 1, further comprising a second print layer at the second side, the second print layer at least partially defining a second target image having at least a second animal shape, and wherein the second target image is different from the first target image.

7. The assembly of claim 6 wherein the first target image includes a photorealistic first animal shape having a first perspective view, and the second target image includes a photorealistic second animal shape having a second perspective view.

8. The assembly of claim 1 wherein the first target image includes a photographic image.

9. The assembly of claim 1 wherein the first target image includes an illustration of an animal.

10. The assembly of claim 1 wherein the region includes a duplication of the target region, and wherein the replacement label is releasably attached to the backer such that the region covers the target region.

11. The assembly of claim 1 wherein the first internal organ structure includes at least one of a heart, a lung, a liver and a spine.

12. The assembly of claim 1 wherein the first target image includes an illustration of a plurality of internal organ structures configured to overlay the first animal shape in a generally anatomically correct position.

13. The assembly of claim 1 wherein the first target image includes the first animal shape having a realistic size and color as a representative animal.

14. The assembly of claim 13 wherein the target region of the first target image includes the realistic size and color, and wherein the illustration of the first internal organ structure includes a full-scale illustration positioned in an anatomically correct location relative to the first animal shape.

15. The assembly of claim 1 wherein the illustration of the first internal organ structure includes an outline of the first internal organ structure in an anatomically correct position.

16. The assembly of claim 1 wherein the illustration of the first internal organ structure includes a color different from a realistic color for a representative animal.

17. The assembly of claim 1 wherein the second print layer further includes a super-imposed pattern over the illustration of the first internal organ structure, the pattern including concentric rings.

18. The assembly of claim 1 wherein the first animal shape includes a broadside perspective view of an animal image.

19. The assembly of claim 1 wherein the first animal shape includes one of a front perspective view and a rear perspective view of an animal image.

20. The assembly of claim 1 wherein the first animal shape includes one of a top perspective view and a bottom perspective view of an animal image.

21. The assembly of claim 1 wherein the target image includes an exterior image region surrounding the first animal shape, the exterior image region having one or more environmental feature shapes.

22. The assembly of claim 1 wherein the first animal shape includes a game animal.

23. The assembly of claim 1 wherein the first animal shape includes a turkey.

24. The assembly of claim 1 wherein the first animal shape includes one of a vermin, a bird, a canid, and a feld.

25. The assembly of claim 1 wherein the replacement label further includes a fourth print layer on the back surface, the second label print layer at least partially defining a portion of a second animal shape, and wherein at least one of the front surface and the back surface may be releasably attached to the backer.

26. The assembly of claim 1 wherein the replacement label further includes a second label print layer on the back surface, the second label print layer at least partially defining the region, and wherein the second label print layer does not include the illustration of the first internal organ structure.

27. The assembly of claim 1 wherein the substrate includes a core layer, and wherein the first print layer is attached to the core layer.

28. The assembly of claim 1 wherein the target image is printed directly on the substrate.

29. The assembly of claim 1, further including a stand for supporting at least the backer in a position that is generally parallel to the horizon.

30. The assembly of claim 1 wherein the first print layer at least partially defines a plurality of target images, individual target images each having at least an animal shape.

31. The assembly of claim 30 wherein the individual animal shapes include different perspective views of a representative animal image.

32. The assembly of claim 1, further comprising a projectile-stopping material.
33. A shooting target system, comprising:

a target assembly including:

- a target backer having a first side and a second side generally facing opposite from the first side;
- a first target image on the first side, the first target image including a first animal shape having a first target region;
- a plurality of replacement labels, individual replacement labels having a label front surface and a label back surface generally facing opposite from the label front surface, the label front surface including a region image corresponding to the first target region, wherein at least one replacement label is attached to the target backer at the first target region, and wherein the individual replacement labels include a release feature such that penetration of a projectile removes a portion of the region image adjacent to a point of impact and exposes a contrasting surface, the contrasting surface having a first color different from a first region image color; and

an illustration of an internal organ structure overlaying at least one of the first animal shape and the region image.

34. The system of claim 33 wherein at least the first side includes the release feature such that penetration of the projectile removes a portion of the first target image adjacent to a second point of impact and exposes a second contrasting surface, the second contrasting surface having a second color aligned at least with the first animal shape, and wherein the second color is different from the first color and a target image color.

35. The system of claim 33, further comprising a second target image on the second side, the second target image including a second animal shape having a second target region, the second animal shape being different from the first animal shape.

36. The system of claim 35 wherein the first target region and the second target region are aligned along a projectile path, the projectile path being generally transverse to the target backer.

37. The system of claim 33 wherein the target assembly is included in a kit, wherein the plurality of replacement labels includes at least one of a) a label having an outline of the illustration of the internal organ structure, b) a label having the illustration of the internal organ structure in a color different from a first animal shape color, and c) a label having the region image at the label front surface and at least the illustration of the internal organ structure at the label back surface.

38. The system of claim 33, further comprising a stand for supporting at least the backer in a position that is generally parallel to the horizon.

39. The system of claim 38, wherein one of the first animal shape and the second animal shape includes one of a top perspective view and a bottom perspective view of an animal image.

40. A shooting assembly, comprising:

- a target backer having a photorealistic image presented on a first side, the photorealistic image including an animal image, the animal image having a size approximately the same size as a representative animal;
- a replacement label having a portion of the animal image; and
- an illustration of an internal organ structure carried by the replacement label.

41. The shooting assembly of claim 40 wherein the illustration of the internal organ structure is configured to overlay the portion of the animal region in a generally anatomically correct position.

42. The assembly of claim 40 wherein the animal image includes at least one of a broadside perspective view, a front perspective view, a rear perspective view, a bottom perspective view, and a top perspective view.

43. The assembly of claim 40 wherein the replacement label is attached to the target backer and covers a portion of the photorealistic image, and wherein the portion of the animal image is photorealistic and aligns with the photorealistic image to form a seamless transition between the portion of the animal image and the photorealistic image.

44. The assembly of claim 40 wherein:

- the photorealistic image is at least partially defined by a first print layer, the first print layer including a release feature such that penetration of a projectile removes a portion of the first print layer adjacent to a point of impact and exposes a first contrasting surface adjacent to the first print layer, the first contrasting surface having a first color aligned at least with the animal image;

- the portion of the animal image is at least partially defined by a label print layer, the label print layer including the release feature such that penetration of the projectile removes a portion of the label print layer adjacent to the point of impact and exposes a second contrasting surface adjacent to the label print layer; and

wherein the second contrasting surface includes a second color aligned at least with the illustration of the internal organ structure.

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