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(54) **WEAPON FOR LETHAL AND NON-LETHAL USES**

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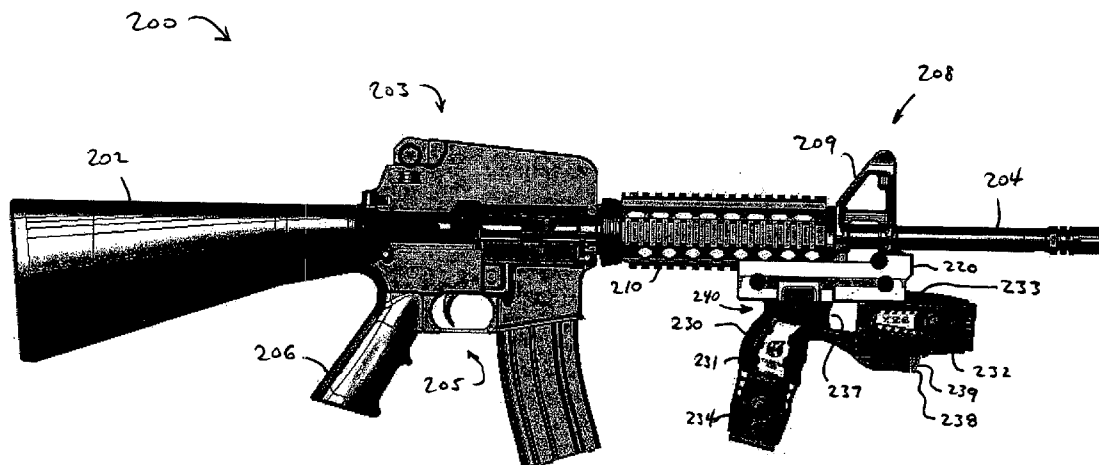
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(57) **ABSTRACT**

A weapon that provides lethal force or non-lethal force at the discretion of the operator of the weapon includes a non-lethal implement attached by a support to the apparatus for lethal force. The support attaches to a picatinny rail and to a stop of the apparatus, such as a sight mounted on the barrel of the apparatus for lethal force.

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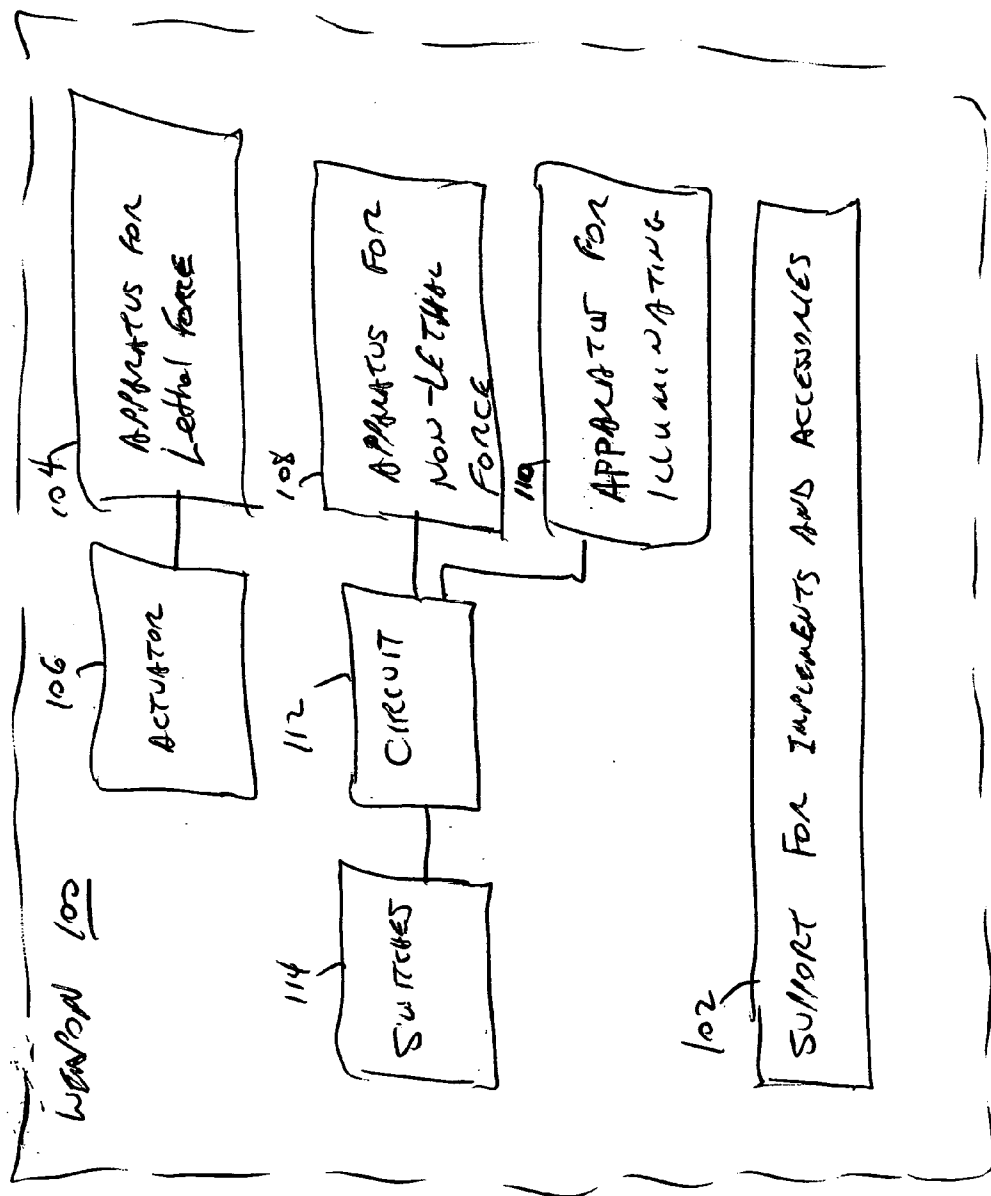
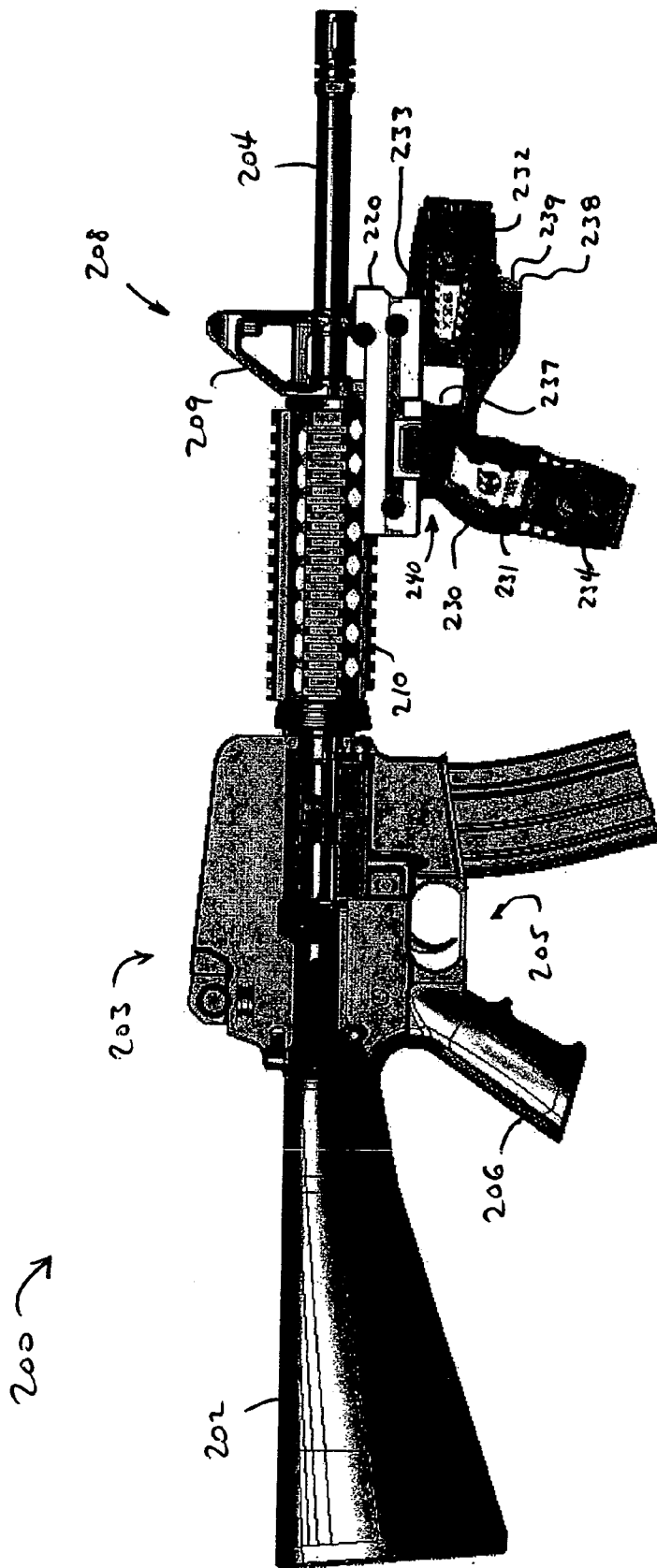


FIG. 1



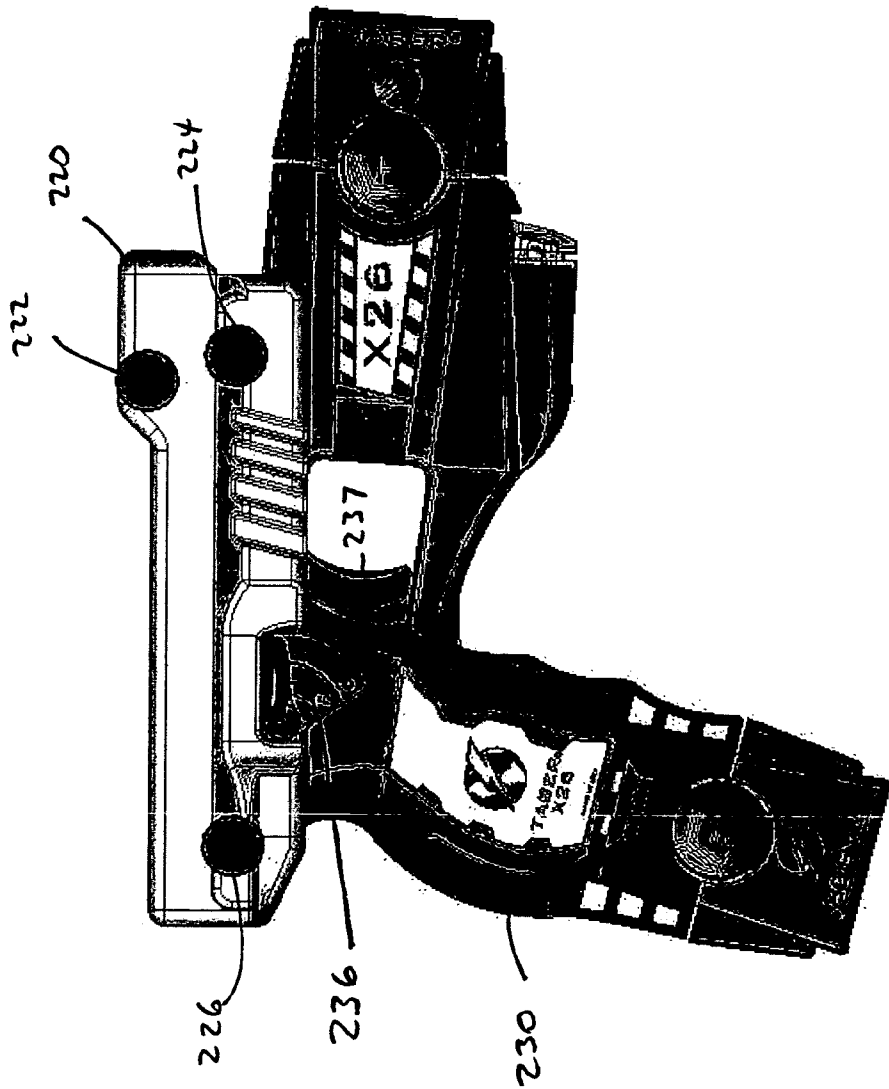


FIG. 3

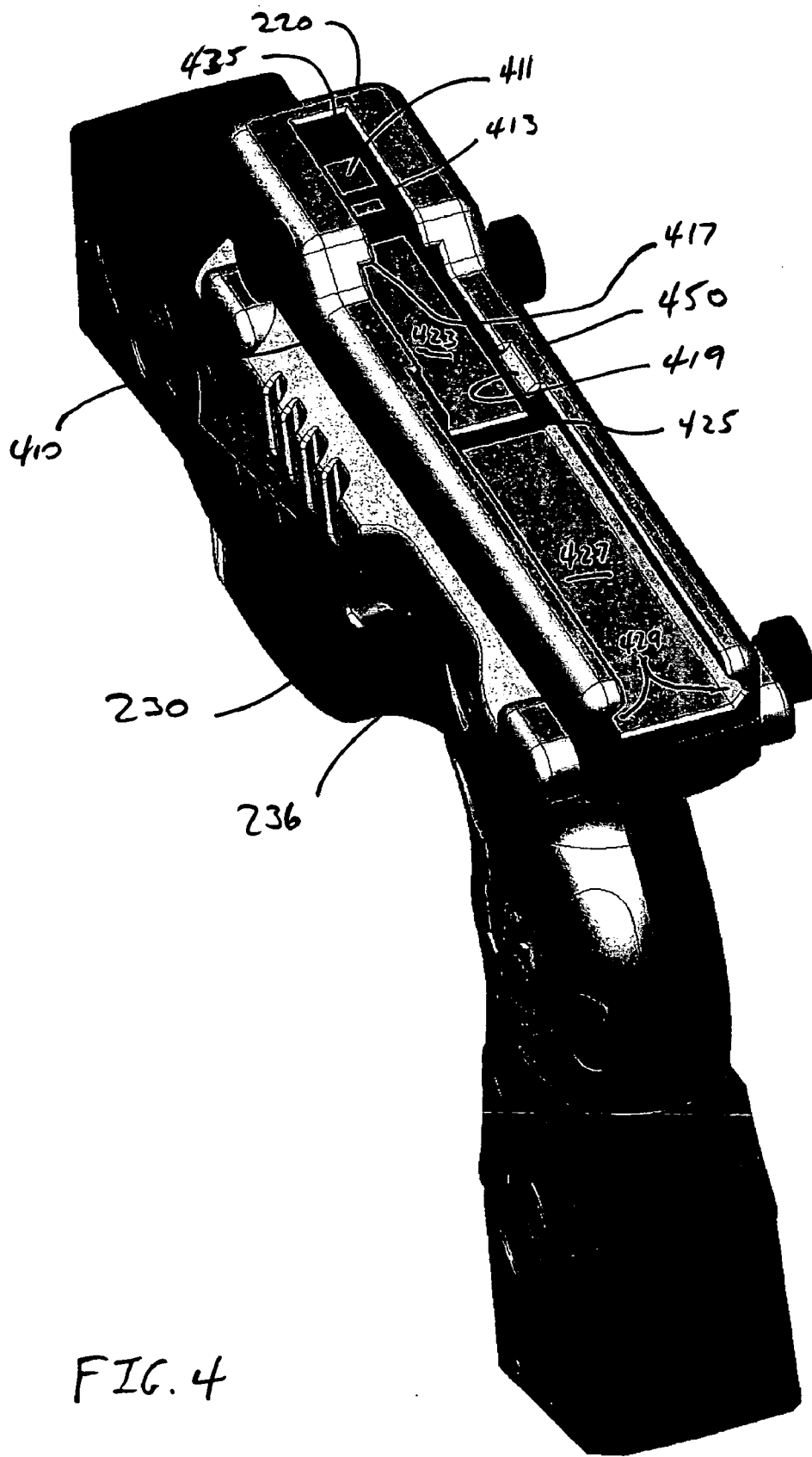


FIG. 4

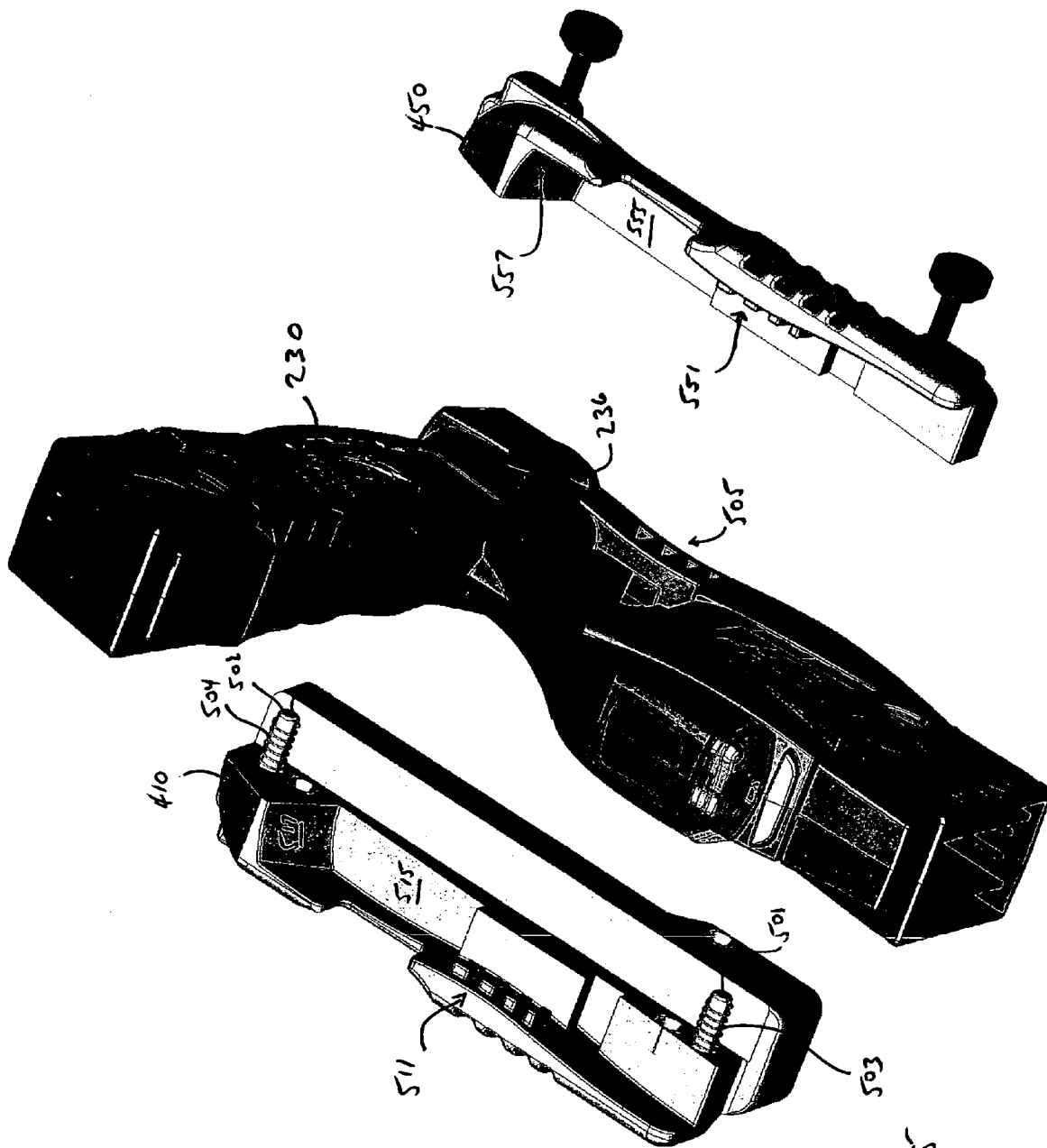


FIG. 5

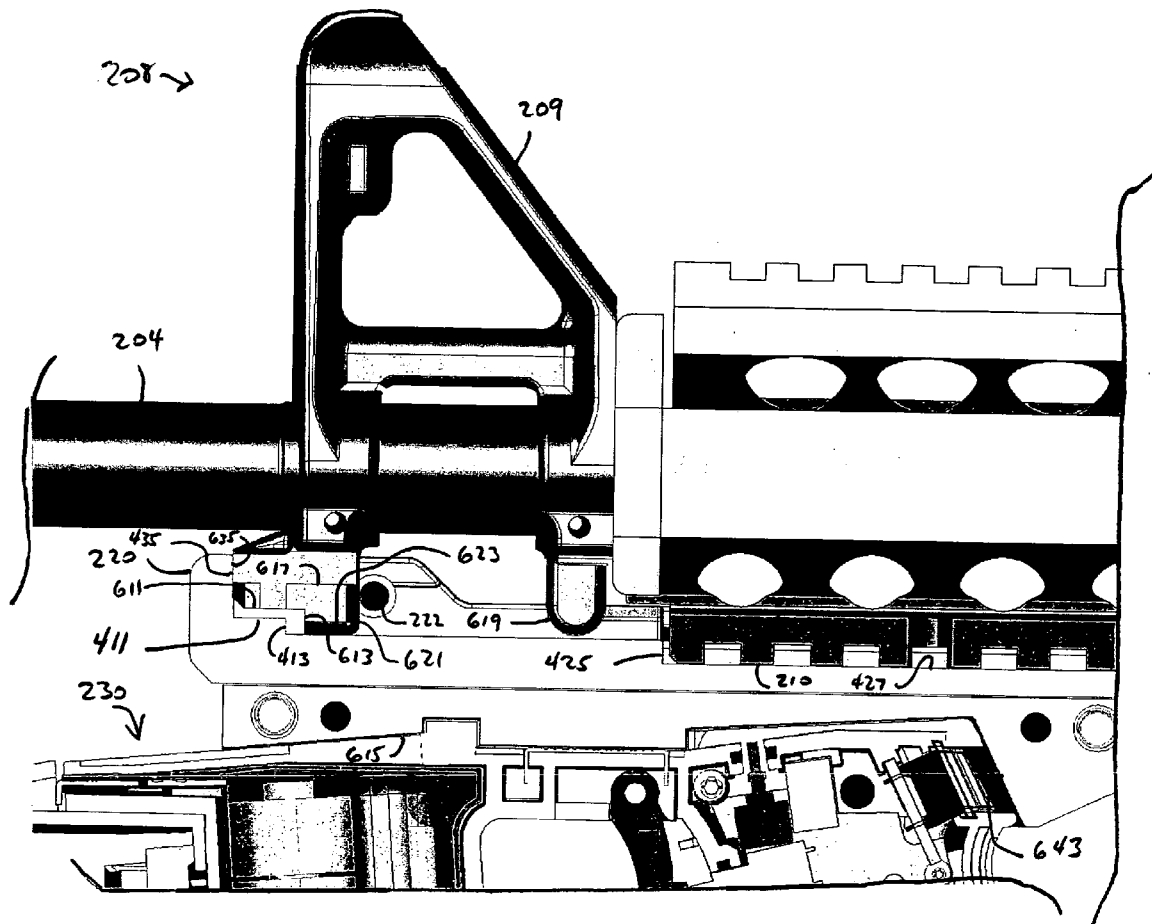


FIG. 6

WEAPON FOR LETHAL AND NON-LETHAL USES

FIELD OF THE INVENTION

[0001] Embodiments of the present invention relate to weapons, accessories, and implements.

BACKGROUND OF THE INVENTION

[0002] Conventional weapons directed to a human target include lethal weapons having mounted thereon a mechanically actuated chemical non-lethal weapon.

[0003] Implements and accessories have been mounted on weapons. These include sights, flashlights for illuminating the target, and dispensers for dispensing chemical agents toward the target. Rails including the picattiny rail provide for mounting of mission specific combinations of implements and accessories.

[0004] Without weapons of the present invention and without the apparatus and methods for attaching implements and accessories according to various aspects of the present invention, users of weaponry cannot suitably take advantage of electronic non-lethal implements.

SUMMARY OF THE INVENTION

[0005] A weapon, according to various aspects of the present invention, includes a circuit and an apparatus that provides lethal force and non-lethal force. The circuit includes a switch and a source of illumination, wherein: the circuit controls illumination from the source for aiming the non-lethal force; and the circuit controls release of the non-lethal force in response to operation of the switch.

[0006] By controlling from a circuit the illumination and the release, the arrangement of controls is suitable for reliable use of the weapon.

[0007] A weapon, according to various aspects of the present invention, for use by an operator, includes an apparatus that provides lethal force, non-lethal force, illumination, first and second triggers and a switch. The first trigger is operable with a first hand of the operator for releasing the lethal force. The switch is operable with a second hand of the operator when the second hand is in a position to operate the second trigger. The second trigger is for releasing the non-lethal force. The illumination is controlled in response to operation of the switch.

[0008] A support, according to various aspects of the present invention, is used for attaching an implement to a firearm where the firearm has a rail and a sight bracket. The support includes an apparatus for mechanically coupling the implement to the rail; and an apparatus for coupling the implement to the sight to reduce motion of the implement along the rail parallel to a direction of delivery of the lethal force.

[0009] A support, according to various aspects of the present invention, is used for attaching a non-lethal implement to a firearm where the firearm has a rail and a stop. The support includes a first channel that receives the rail to mechanically couple the non-lethal implement and the rail. The support further includes a first abutment surface that abuts the stop, a first fastener that maintains the first abutment surface against the stop, a second channel that receives

the non-lethal implement; and a second fastener that retains the non-lethal implement in the second channel.

BRIEF DESCRIPTION OF THE DRAWING

[0010] Embodiments of the present invention will now be further described with reference to the drawing, wherein like designations denote like elements, and:

[0011] **FIG. 1** is a functional block diagram of a weapon according to various aspects of the present invention;

[0012] **FIG. 2** is a side view of an implementation of the weapon of **FIG. 1**;

[0013] **FIG. 3** is a side view of support **220** on apparatus **230** of **FIG. 1**;

[0014] **FIG. 4** is a top perspective view of support **220** of **FIG. 2**;

[0015] **FIG. 5** is a bottom exploded view of support **220** and apparatus **230** of **FIG. 2**; and

[0016] **FIG. 6** is a cross-section view of the support **220** installed per **FIG. 2**.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0017] Weaponry is conventionally designed to operate with high reliability due to its ordinary use in life threatening situations. These situations include conditions that are adverse to mechanical and electronic apparatus such as high and low temperatures, high and low humidities, vibrations, severe mechanical shocks, exposures and submersions in fresh water, snow, salt water, mud, and sand to name a few. Another limitation on reliable operation is the ease with which an operator can properly operate the weapon amid situations that present mental and physical challenges. These include exhaustion, disorientation, warfare, police activity, and surprise to name a few. Generally, operators train and practice with particular weapons. According to various aspects of the present invention, training and practice with particular weapons having capability to deliver lethal and non-lethal force simplifies training and practice with other weapons due to operational similarities, such as placement of hands for arming, aiming, and firing either lethal or non-lethal force.

[0018] Weapons, according to various aspects of the present invention, perform as discussed above and provide lethal force and electronic non-lethal force. These weapons may be used offensively or defensively with respect to targets both animal and human. For example, weapon **100** of **FIG. 1** includes support **102** for implements and accessories, apparatus **104** for lethal force and its actuator **106**, apparatus **108** for non-lethal force, a circuit **112** and switches **114** used in part to activate non-lethal force, and apparatus **110** for providing illumination.

[0019] Support **102** provides mechanical alignment and stability and provides ease of mounting for mission specific implements and accessories of conventional types such as scopes, sights, night vision, targeting, illumination, and other apparatus for lethal and non-lethal force. In various implementations of weapon **100**, support **102** is integral or rigidly connected to apparatus **104** and provides support for apparatus **108**. In other implementations, support **102** is

integral or rigidly connected to a combination comprising apparatuses **104**, **108** and **110**. In other implementations of weapon **100**, support **102** is omitted.

[0020] Apparatus **104** and actuator **106** cooperate to provide lethal force in any conventional manner, such as propelling a projectile. Actuator **106** may be a mechanical trigger that activates apparatus **104** to deliver lethal force. Consistent with the purposes for weapon **100**, apparatus **104** may include conventional components (e.g., any hand gun, rifle, carbine, or grenade launcher).

[0021] Apparatus **108**, circuit **112**, and switches **114** cooperate to provide non-lethal force. In various implementations, apparatus **108** circuit **112** and switches **114** are electronic, for instance being of the type described in U.S. Pat. Nos. 3,803,463; 5,654,867; 6,256,916; 6,636,412; and application Ser. Nos. 10/364,164; and 10/447,447. Electromechanical switches **114** may include a safety switch and a trigger switch that provide conventional electrical signals in response to manual operation by the operator of weapon **100**. Operation of the safety switch arms weapon **100** for delivery of non-lethal force. Subsequent operation of the trigger switch activates apparatus **108** to deliver non-lethal force. Circuit **112** receives signals from switches **114**, for example, including indicia of operation of the safety and trigger switches discussed above. According to various aspects of the present invention, circuit **112** may include a battery, a high voltage power supply, and control circuits for operating apparatuses **108** and **110**.

[0022] Apparatus **110** provides illumination. In implementations according to various aspects of the present invention, illumination may be generally directed toward the target (e.g., a flashlight beam), and/or provide guidance for aiming weapon **100** (e.g., a laser targeting spot on the target). Apparatus **110** is controlled by circuit **112**, for example, to provide illumination in response to arming of apparatus **108** (e.g., responsive to arm switch discussed above). Apparatus **110** may be disabled or omitted in other implementations of weapon **100**, for example, when illumination may decrease operator safety.

[0023] By controlling one or more apparatuses of weapon **100** from a circuit and switches as discussed above, switches may be located economically at positions that are suitable for reliable operation. For example, actuator **106** for apparatus **104** may be located for use by an operator's right hand (e.g., for a right handed operator); and switches **114** may be located for use by the operator's left hand (or vice versa for a left handed operator). Training and practice may associate lethal force with the right hand and non-lethal force with the left hand. Such training and practice may simplify training with other weapons having different forms of lethal force, and/or different forms of non-lethal force. Illumination as discussed above is of a non-lethal nature. Consistently, operation of illumination apparatus **110** from switches **114** located for use by the operator's left hand reinforces the non-lethal functions served by the left hand.

[0024] Weapon **100** may include a conventional weapon for apparatus **104** and activator **106**. For example, weapon **200** of FIG. 2 includes a conventional M16 automatic weapon, well known for military use. Weapon **200** includes stock **202**, firing assembly **203**, barrel **204**, hand grip **206**, and sight **208** (e.g., corresponding generally to apparatus **104**). A mechanical trigger **205** functions as actuator **106** and may include a safety mechanism, reducing the risk of inadvertent operation of trigger **205**. Weapon **200** further includes rail **210** (e.g., a picatinny rail) and support **220** (e.g.,

corresponding generally to support **110**). Finally, weapon **200** includes an electronic disabling device **230** (e.g., an integrated implementation corresponding to switches **114**, circuit **112**, and apparatuses **108** and **110**).

[0025] Electronic disabling device **230** (of FIGS. 2-5) includes hand grip **231** and body **233**. Body **233** includes a circuit (not shown), safety switch **236**, trigger switch **237**, flashlight **238**, and laser light **239**. In various implementations, electronic disabling device may be of the type marketed as model M26 or X26 by Taser International, Inc. Device **230** may further include a display **240** (e.g., LED digits and indicators) coupled to the circuit within body **233** for display of configuration information, operator and factory settings, and a log of the time of each operation of device **230**.

[0026] A cartridge **232** is mounted at the front of body **233** for operation; and, a spare cartridge **234** is stored at the base of hand grip **231** (FIG. 5 cartridges are empty). In various implementation cartridges **232** and **234** include darts tethered to the circuit in body **233** and/or electrified projectile(s) charged from the circuit in body **233**. For example, electrified projectiles may be of the types described in U.S. Provisional Patent applications 60/509,577 filed Oct. 7, 2003 by Patrick W. Smith et al., and 60/509,480 filed on Oct. 8, 2003 by Patrick Smith et al., and U.S. Pat. No. 5,698,815 to Ragner.

[0027] A support, according to various aspects of the present invention, reliably maintains the attachment and alignment of apparatuses for lethal force, for non-lethal force, and for illumination. Such a support may be manufactured using any conventional processes (e.g., casting, molding, machining). In the implementation shown in FIG. 2, support **220** slides onto a rail and is coupled to a stop.

[0028] For example, support **220** in weapon **200** receives rail **210** and abuts several surfaces of bracket **209**. In weapon **200**, support **220** slides on rail **210** but is stopped by being coupled to bracket **209** which serves in general as a stop for the sliding motion. Alignment may assure proper aiming of weapon **200** and proper delivery of lethal and/or non-lethal force. For example, cartridge **232** may deliver darts in a suitable vertical plane when fired in an orientation where device **230** is also aligned in that vertical plane. The support may be registered with each apparatus using any conventional mechanical technique (e.g., abutted, channeled, journaled, or using a key or post fitting a mating structure of the support or the apparatus).

[0029] Support **220**, of FIGS. 2-6, includes left member **410** and right member **450**. Members **410** and **450** are joined by fasteners to simultaneously grasp a stop (e.g., sight bracket **209**) (fastener **222**); device **230** (fastener **224**); and rail **210** and device **230** (fastener **226**). Fasteners may be of any number and type including for example, spring loaded pins and threaded screws (as shown), quarter-turn fasteners (and variations such as half turn), bayonet couplings, clamps, cams, levers, and latches. Spring loading permits separation of members **410** and **450** sufficient to separate device **230** from weapon **100** while maintaining the fasteners **222-226** partially threaded together.

[0030] Support **220** in an alternate implementation attaches independently to one or more apparatuses (e.g., **104**, **108**, **110** in any combination of two groups) facilitating separation of apparatuses (e.g., by quick release fastener(s)) for change of mission, replacement, or functional substitution (e.g., upgrade). Support **220** may be implemented with

a set of cooperating structures, each integral to any combination of apparatuses 104, 108, and 110. For example, in one such implementation, device 230 comprises an integral first structure for fastening with or to a rail (e.g., 210); apparatus 108 comprises a second structure (e.g., a rail and stop); and device 230 further comprises an integral third structure for fastening with or to the second structure.

[0031] Support 220 (FIGS. 4 and 6) includes structures that cooperate with a stop. Step top 411 and step side 413 may abut bracket surfaces 611 and 613 respectively. Lip 417 partially surrounds bracket 209 at surface 617. Bevel 419 locates bracket surface 619. Step top 423 abuts bracket surface 623. Step side 425 may abut rail 210. Channel 427 with wedge shaped grooves 429 accepts rail 210. Screw 222 is in contact with stop surface 621 to maintain surfaces 435 and 635 in abutting contact.

[0032] Support 220 (FIGS. 5 and 6) includes structures that cooperate with device 230. Four posts 511 (551) on each member 410 (450) accept four recesses 505 on each side of device 230. Channel 515 (555) follows the contour 615 of the top of device 230. Rear surface 517 (557) abuts surface 643 of device 230. In addition, pins 501-502 support springs 503-504 and locate members 410 and 450. Screws 224 and 226 are received by threaded inserts 506 and 508.

[0033] The foregoing description discusses preferred embodiments of the present invention which may be changed or modified without departing from the scope of the present invention as defined in the claims. While for the sake of clarity of description, several specific embodiments of the invention have been described, the scope of the invention is intended to be measured by the claims as set forth below.

What is claimed is:

- 1. A weapon for use by an operator, the weapon comprising:
 - apparatus that provides lethal force, non-lethal force, and illumination;
 - a first trigger operable with a first hand of the operator for releasing the lethal force; and
 - a switch and a second trigger, the switch operable with a second hand of the operator when the second hand is in a position to operate the second trigger, the second trigger for releasing the non-lethal force; wherein the illumination is controlled in response to operation of the switch.
- 2. The weapon of claim 1 wherein the illumination is for aiming the non-lethal force.
- 3. The weapon of claim 1 wherein the non-lethal force comprises electromuscular stimulation.
- 4. A weapon comprising:
 - apparatus that provides lethal force and non-lethal force;
 - a circuit comprising a switch and a source of illumination, wherein:
 - (1) the circuit controls illumination from the source for aiming the non-lethal force; and
 - (2) the circuit controls release of the non-lethal force in response to operation of the switch.
- 5. The weapon of claim 1 wherein the non-lethal force comprises electromuscular stimulation.

6. A support for attaching an implement to a firearm, the firearm having a rail and a stop, the support comprising:

- means for mechanically coupling the implement to the rail; and
- means for coupling the implement to the stop to reduce motion of the implement along the rail parallel to a direction of delivery of the lethal force.

7. The support of claim 6 wherein the rail conforms to a picatinny rail.

8. The support of claim 6 wherein the stop comprises a sight.

9. A support for attaching a non-lethal implement to a firearm, the firearm having a rail and a stop, the support comprising:

- a first channel that receives the rail to mechanically couple the non-lethal implement and the rail;
- a first abutment surface that abuts the stop;
- a first fastener that maintains the first abutment surface against the stop;
- a second channel that receives the non-lethal implement; and
- a second fastener that retains the non-lethal implement in the second channel.

10. The weapon of claim 9 wherein the implement delivers a non-lethal force comprising electromuscular stimulation.

11. The support of claim 9 wherein the rail conforms to a picatinny rail.

12. The support of claim 9 wherein at least one of the first fastener and the second fastener is manually releasable without a tool.

13. The support of claim 12 wherein the at least one fastener is released by manually accomplishing a rotary motion of a portion of the fastener to an extent less than 720 degrees.

14. The support of claim 9 wherein the implement delivers non-lethal force from the front of the implement and the second channel comprises a second abutment surface that faces a rear surface of the implement.

15. The support of claim 9 wherein:

- the support comprises a first portion and a second portion; and
- the first fastener mechanically joins the first portion of the support to the second portion of the support.

16. The support of claim 9 wherein:

- the support comprises a first portion and a second portion; and
- the second fastener mechanically joins the first portion of the support to the second portion of the support.

17. The support of claim 9 wherein:

- the support comprises a first portion retained to the rail and a second portion retained to the implement; and
- the support further comprises means for separating the first portion from the second portion without operation of the first fastener or the second fastener.