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(54) **PROPER GRIP CONTROLLERS**

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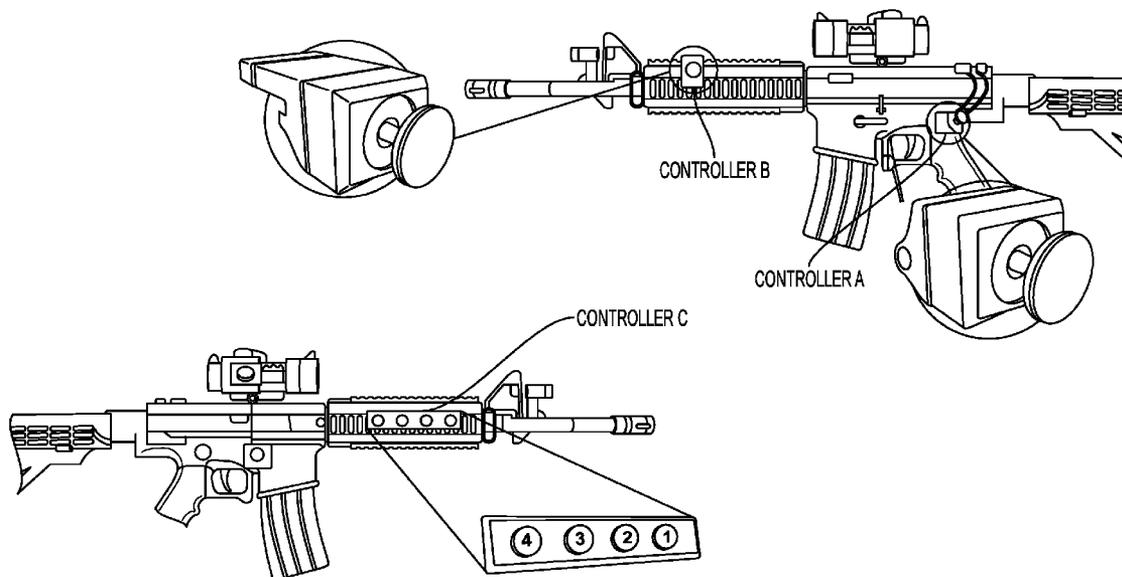
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(52) **U.S. Cl.** ..... **434/16**

(57) **ABSTRACT**

A proper grip controller, having a first controller disposed near a trigger, the first controller comprising a joystick. The first controller is disposed such that a user of the proper grip controller can manipulate the joystick with a thumb while properly holding the proper grip controller.



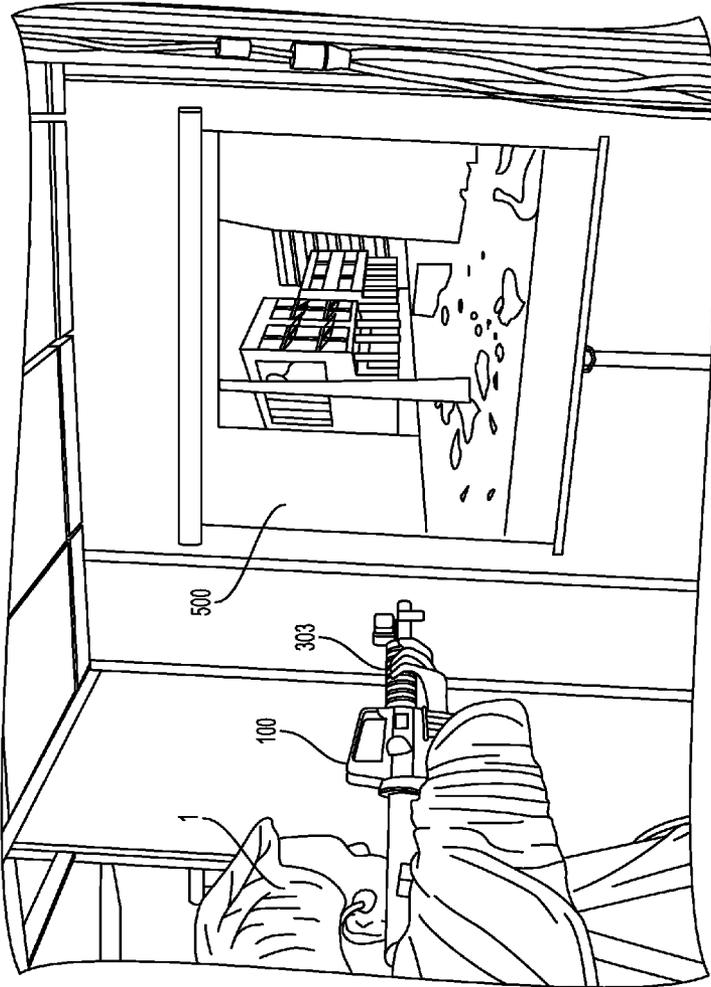


FIG. 1

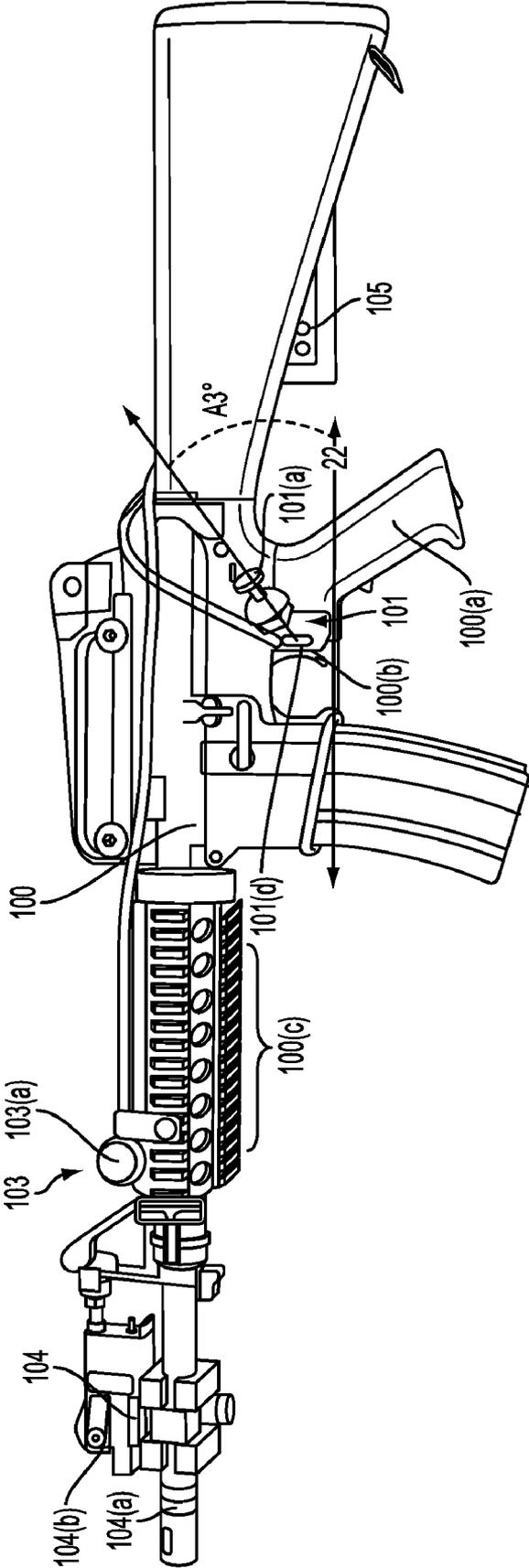


FIG. 2

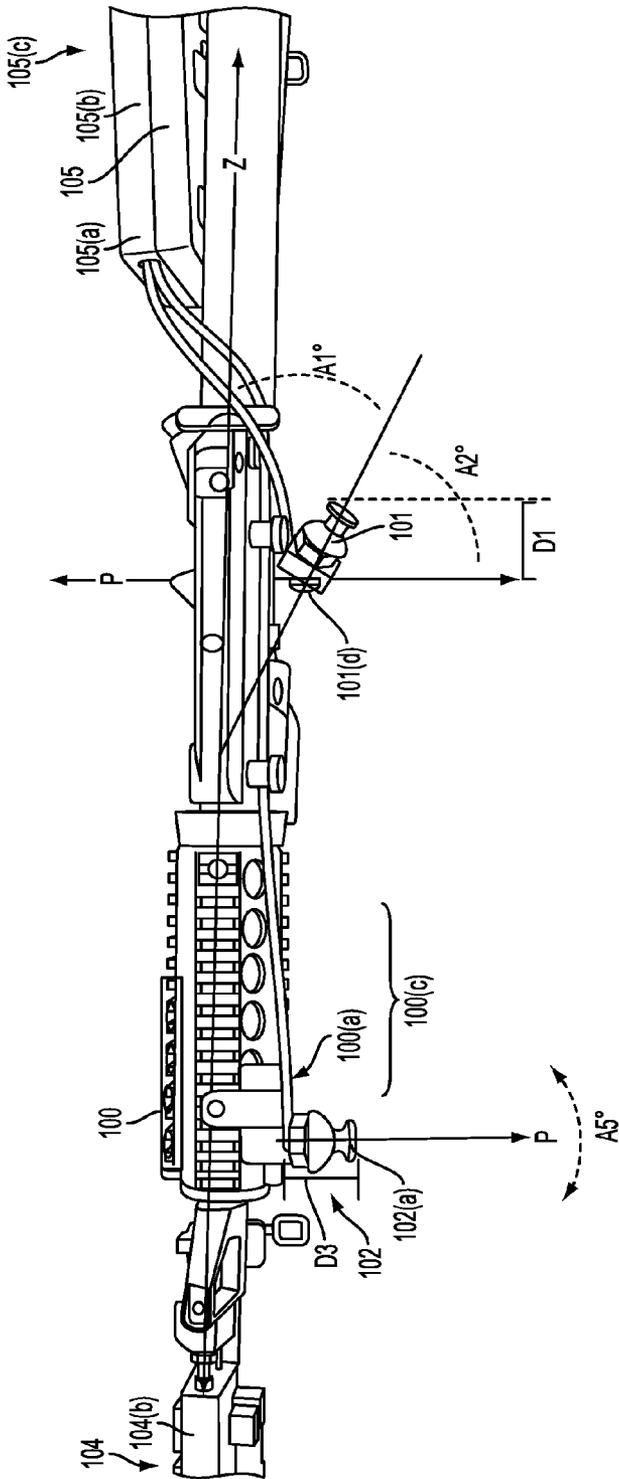


FIG. 3

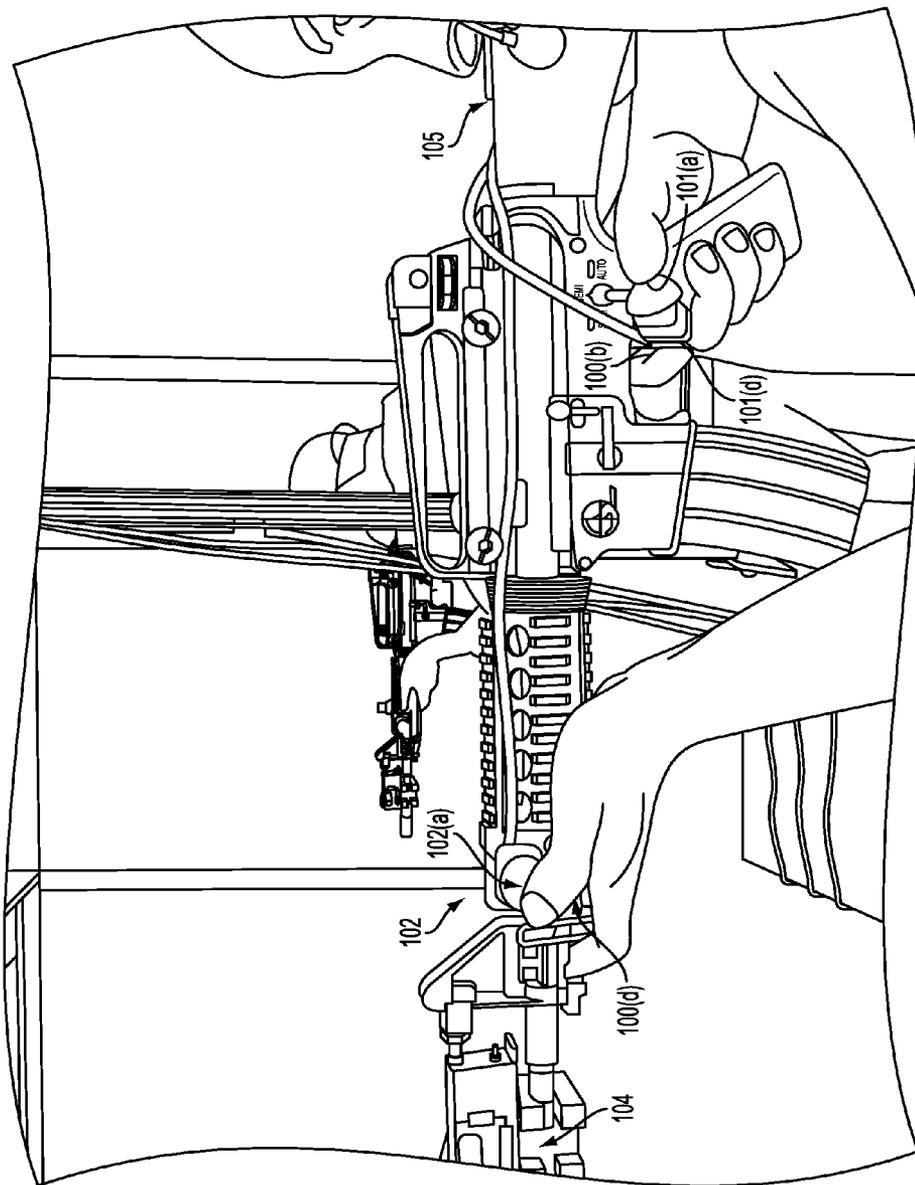


FIG. 4

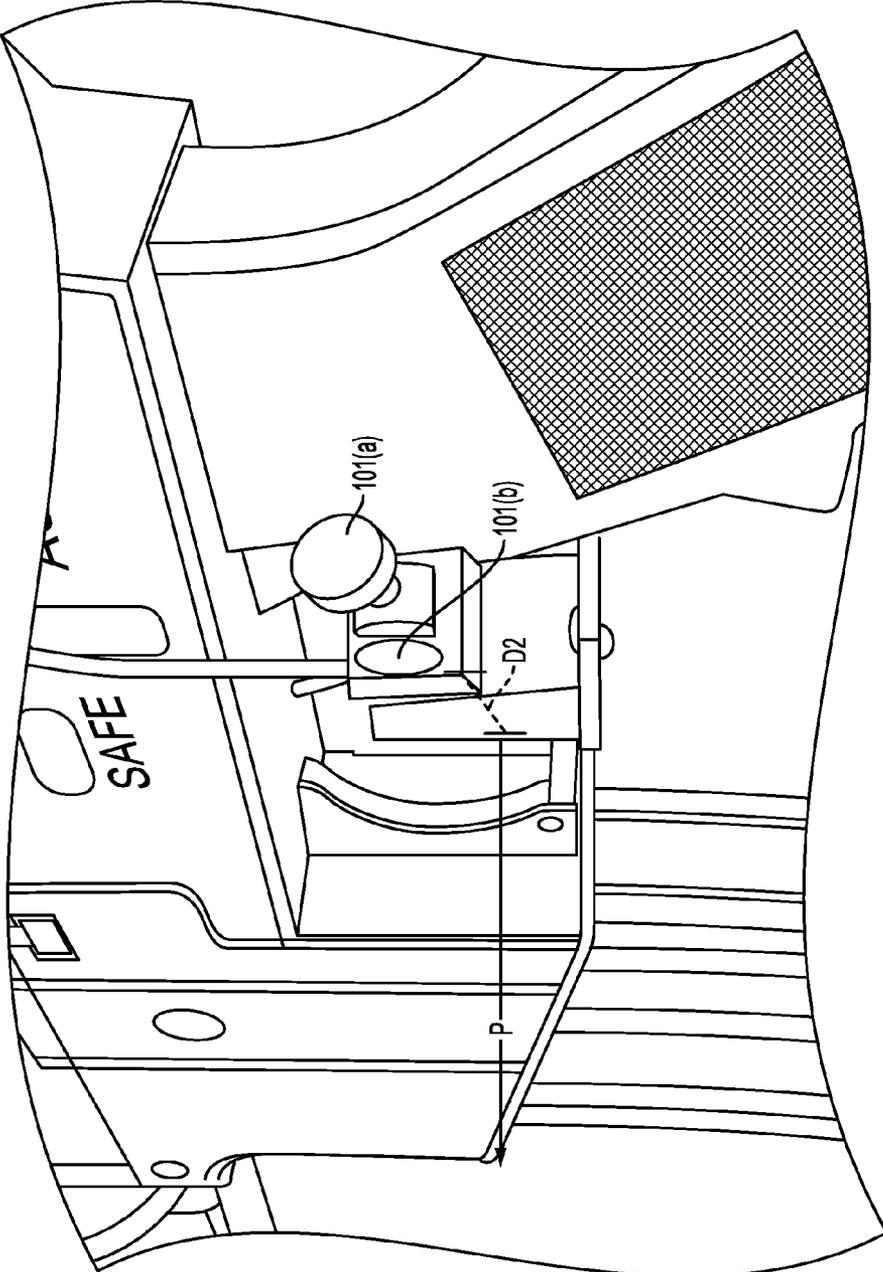


FIG. 5

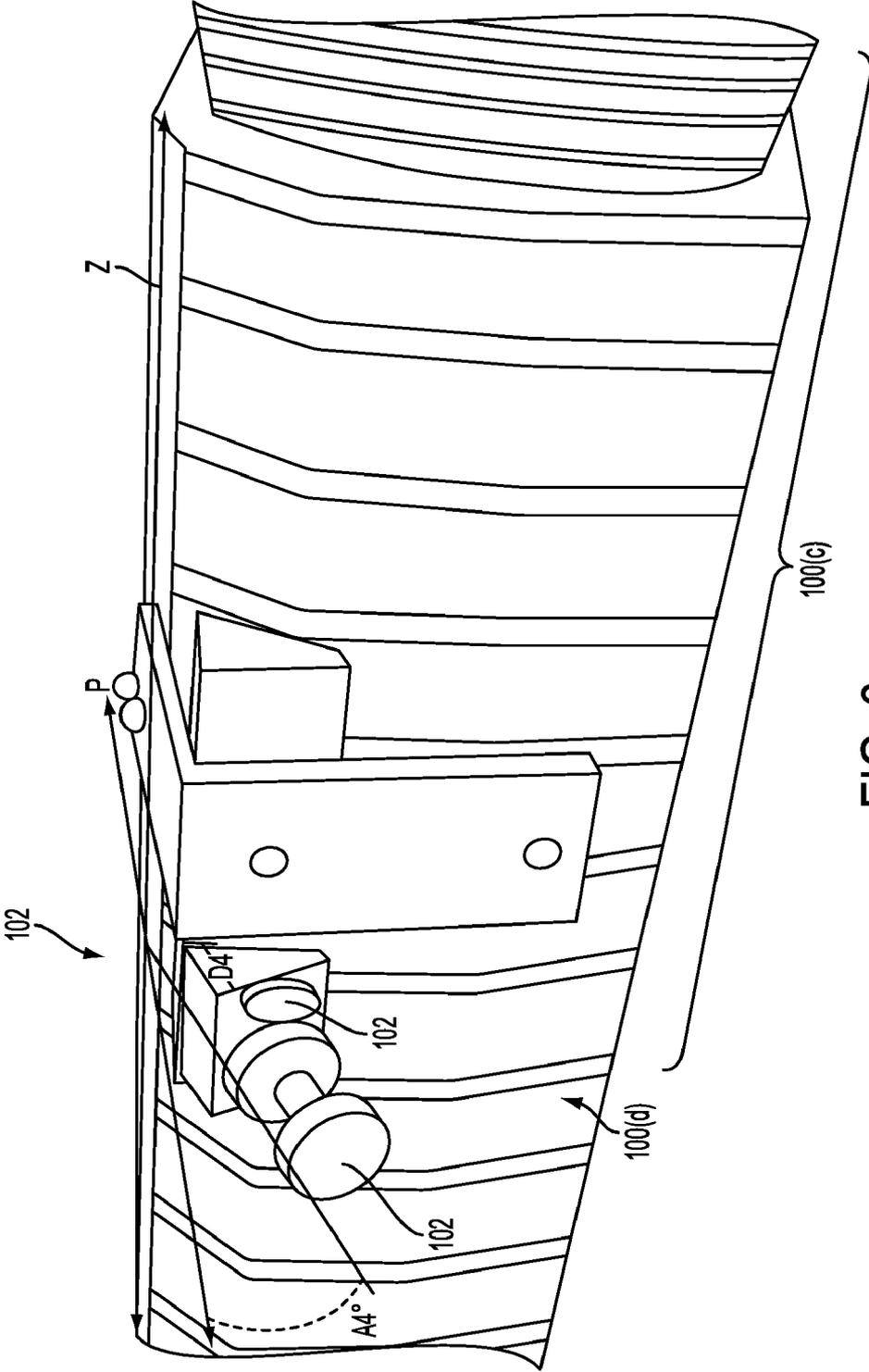


FIG. 6

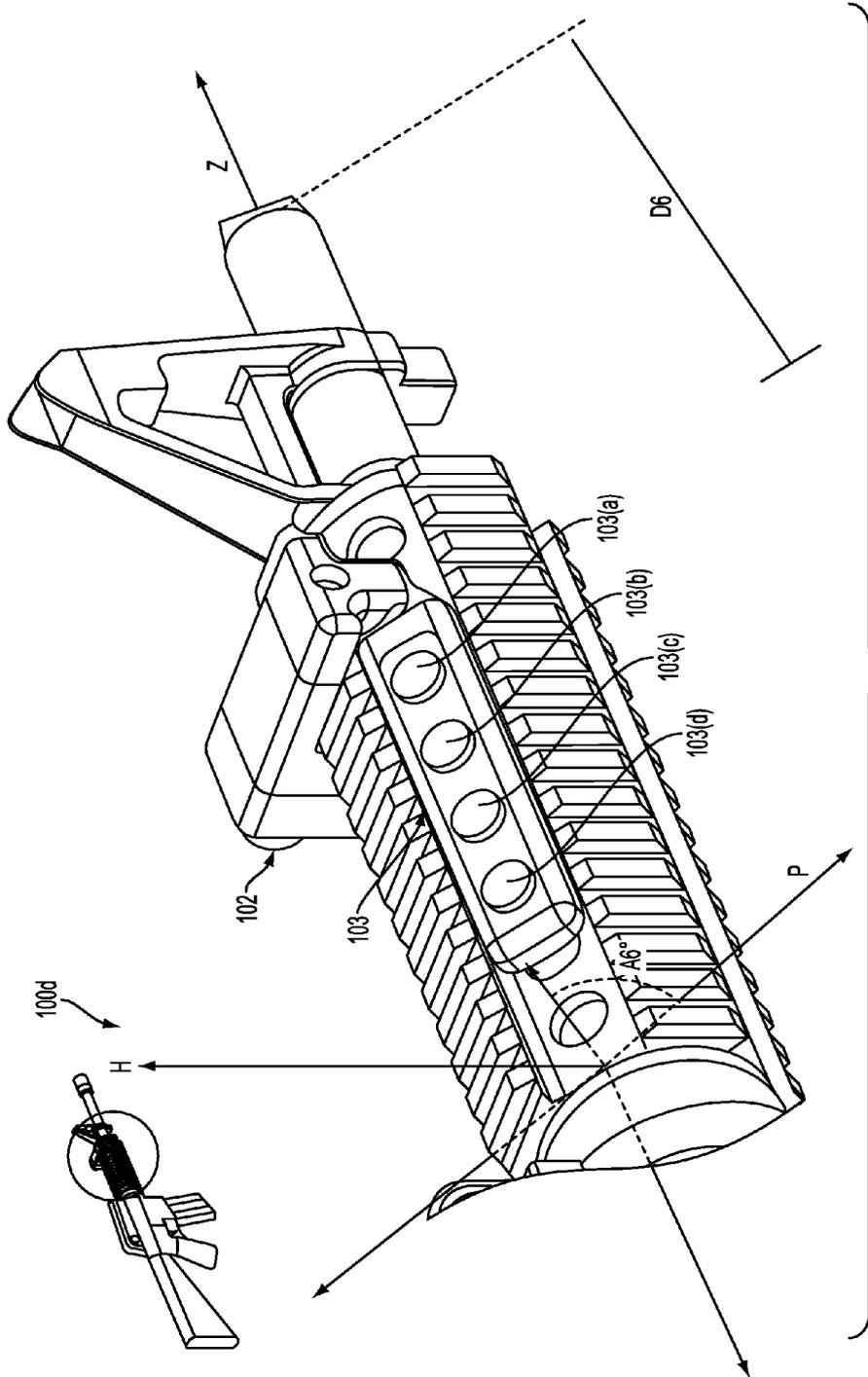


FIG. 7

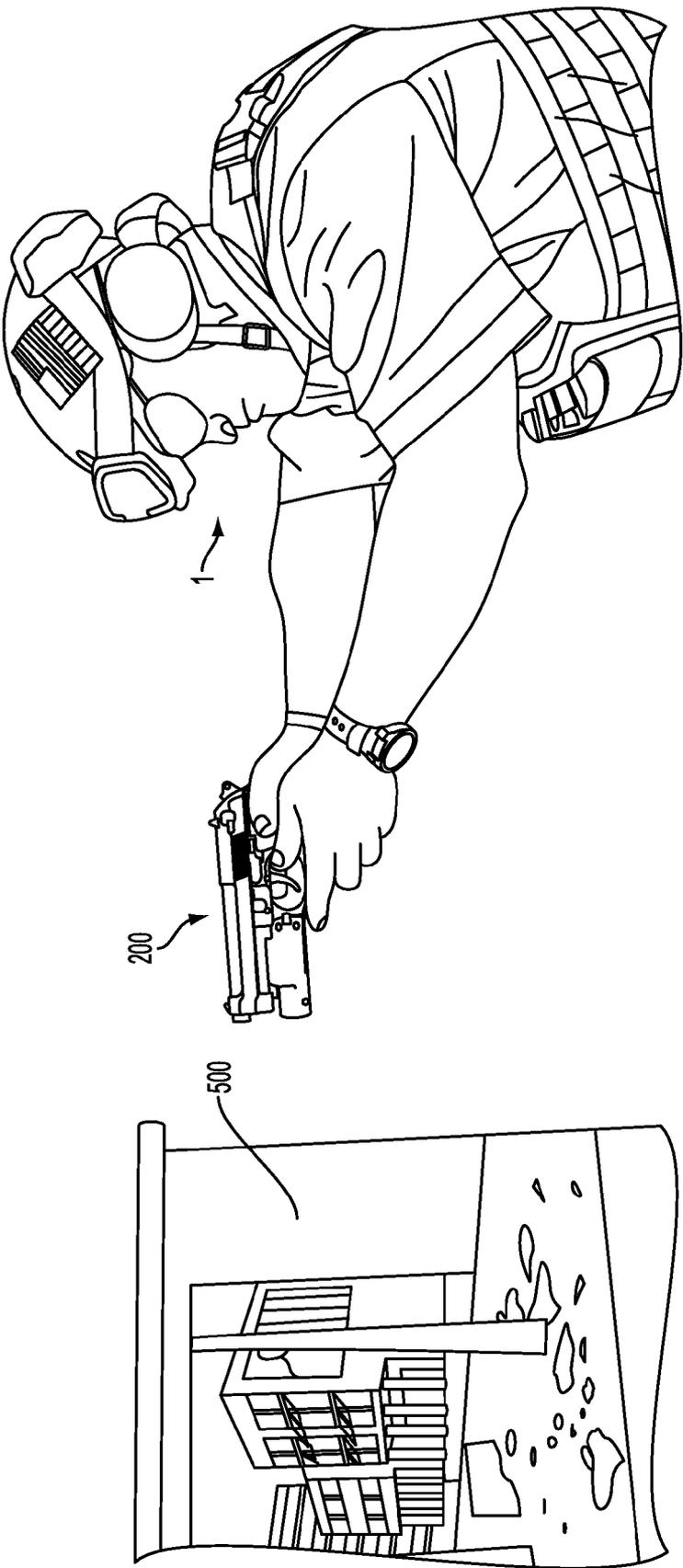


FIG. 8

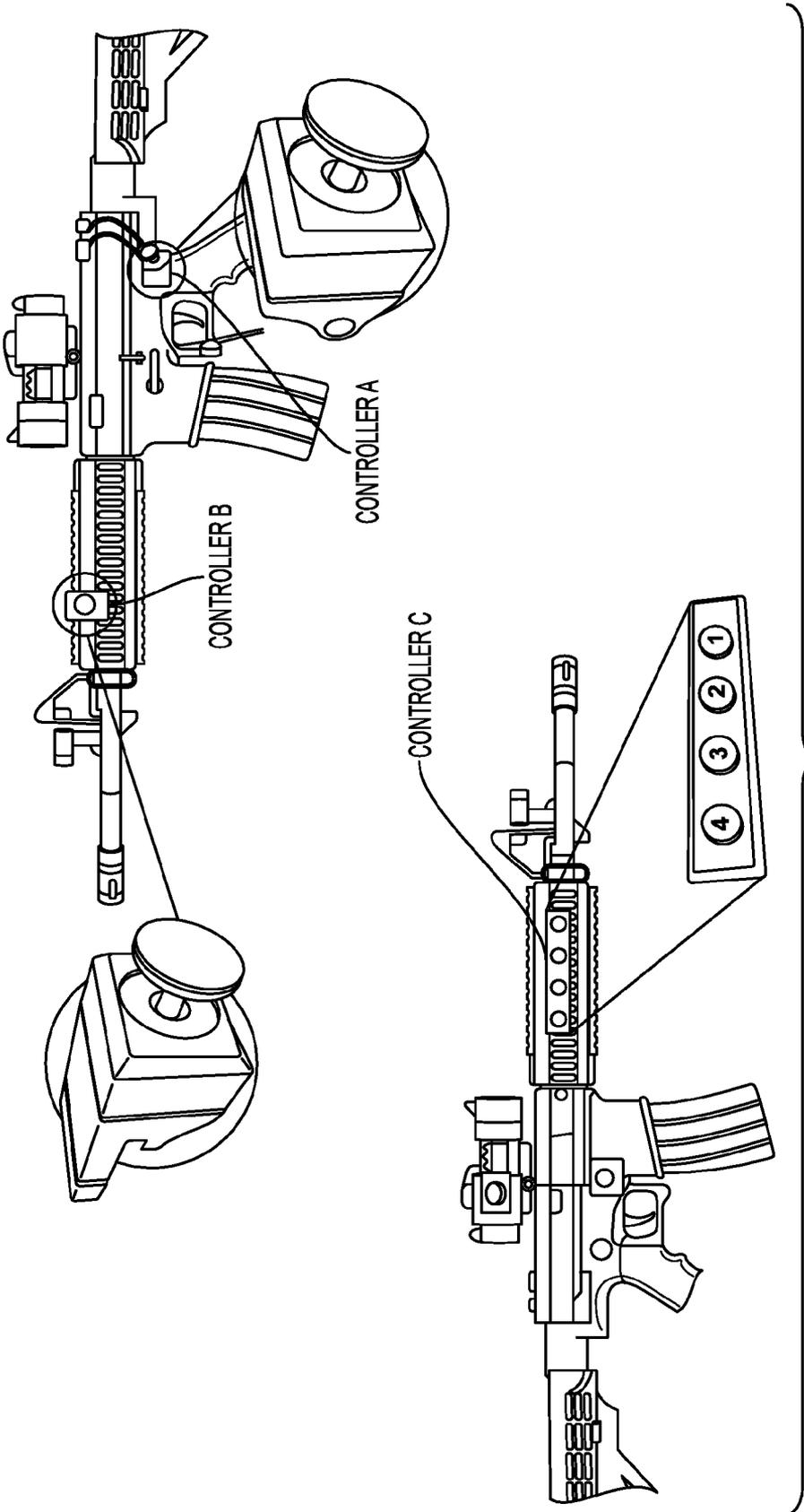


FIG. 9

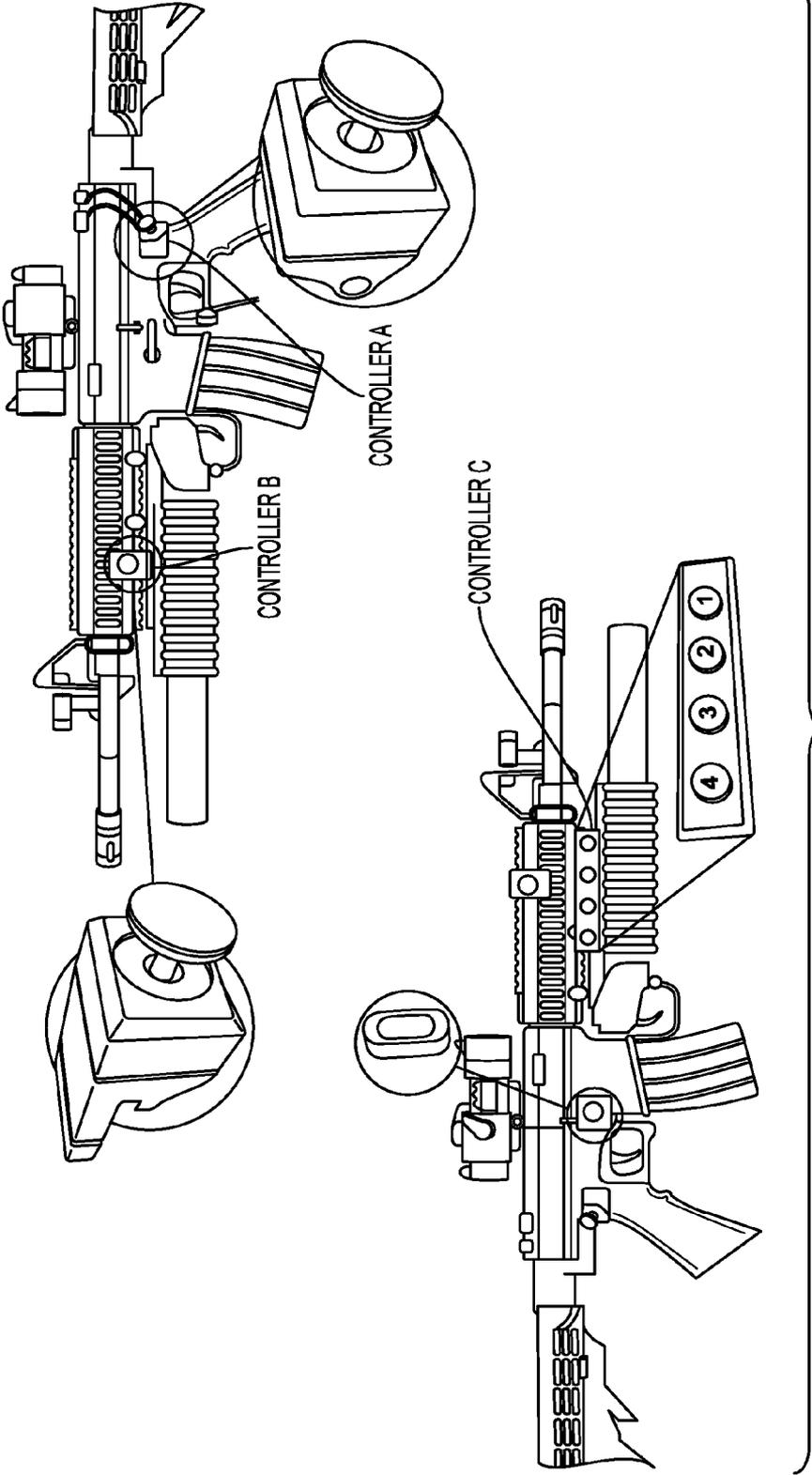
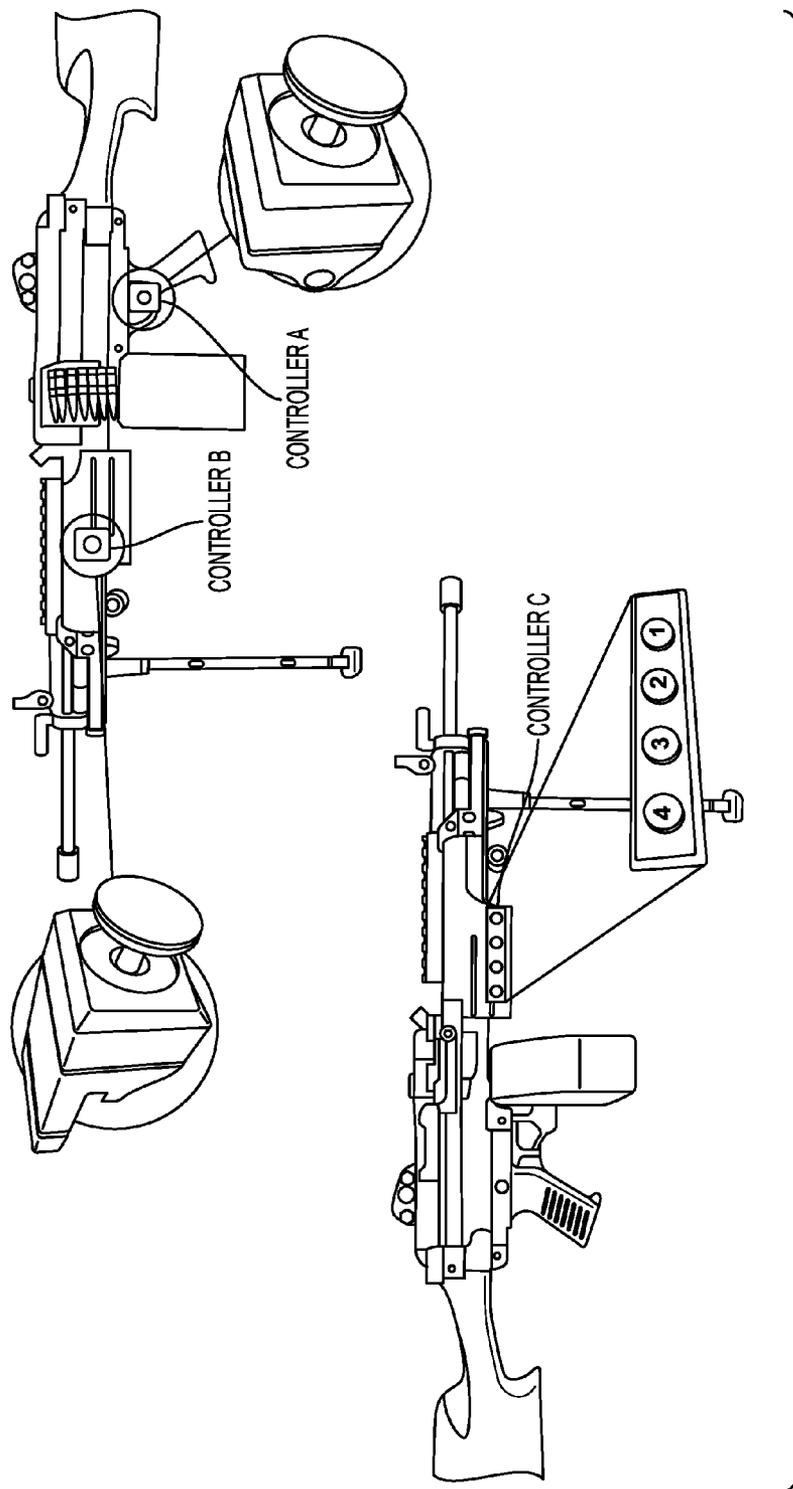


FIG. 10



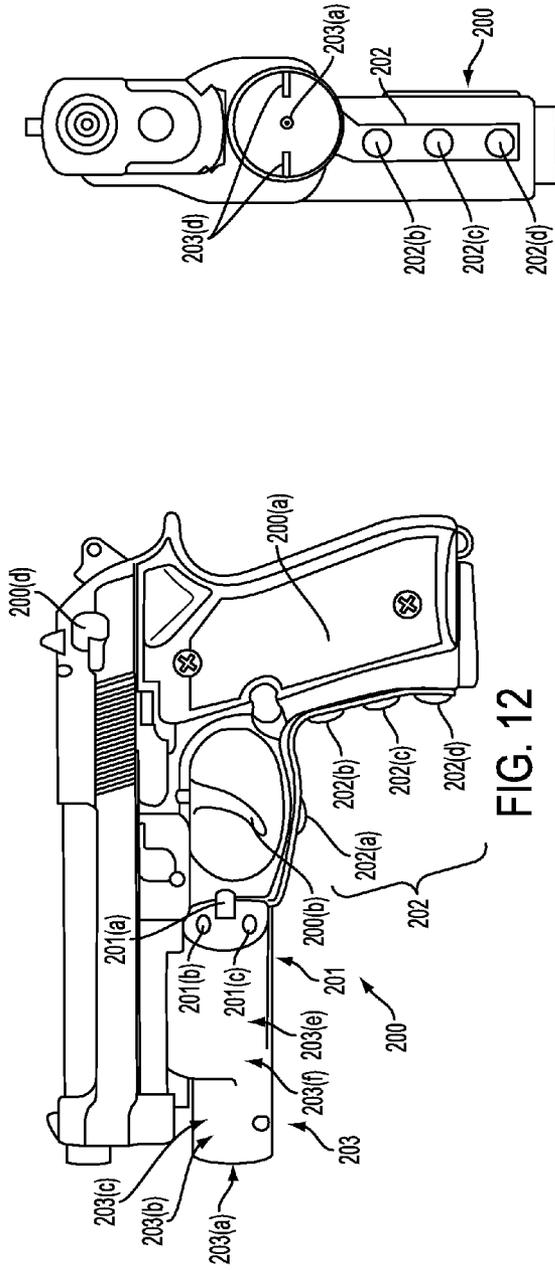


FIG. 12

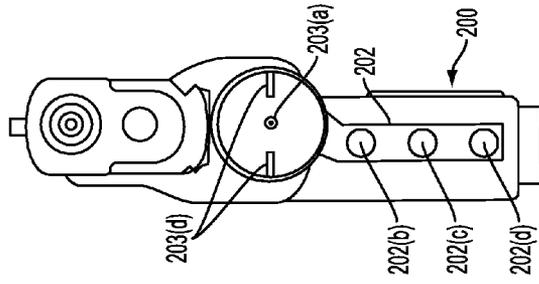


FIG. 13

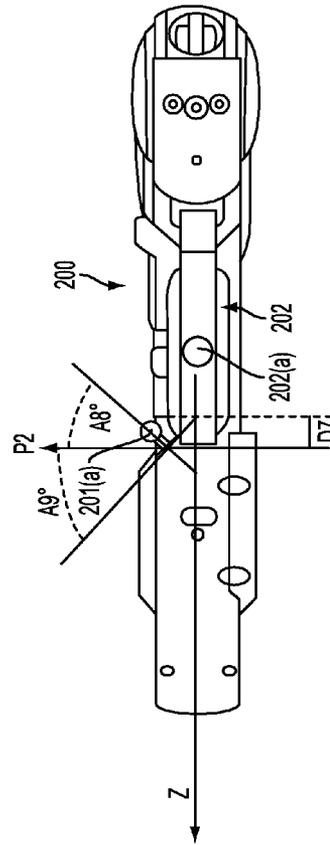


FIG. 14

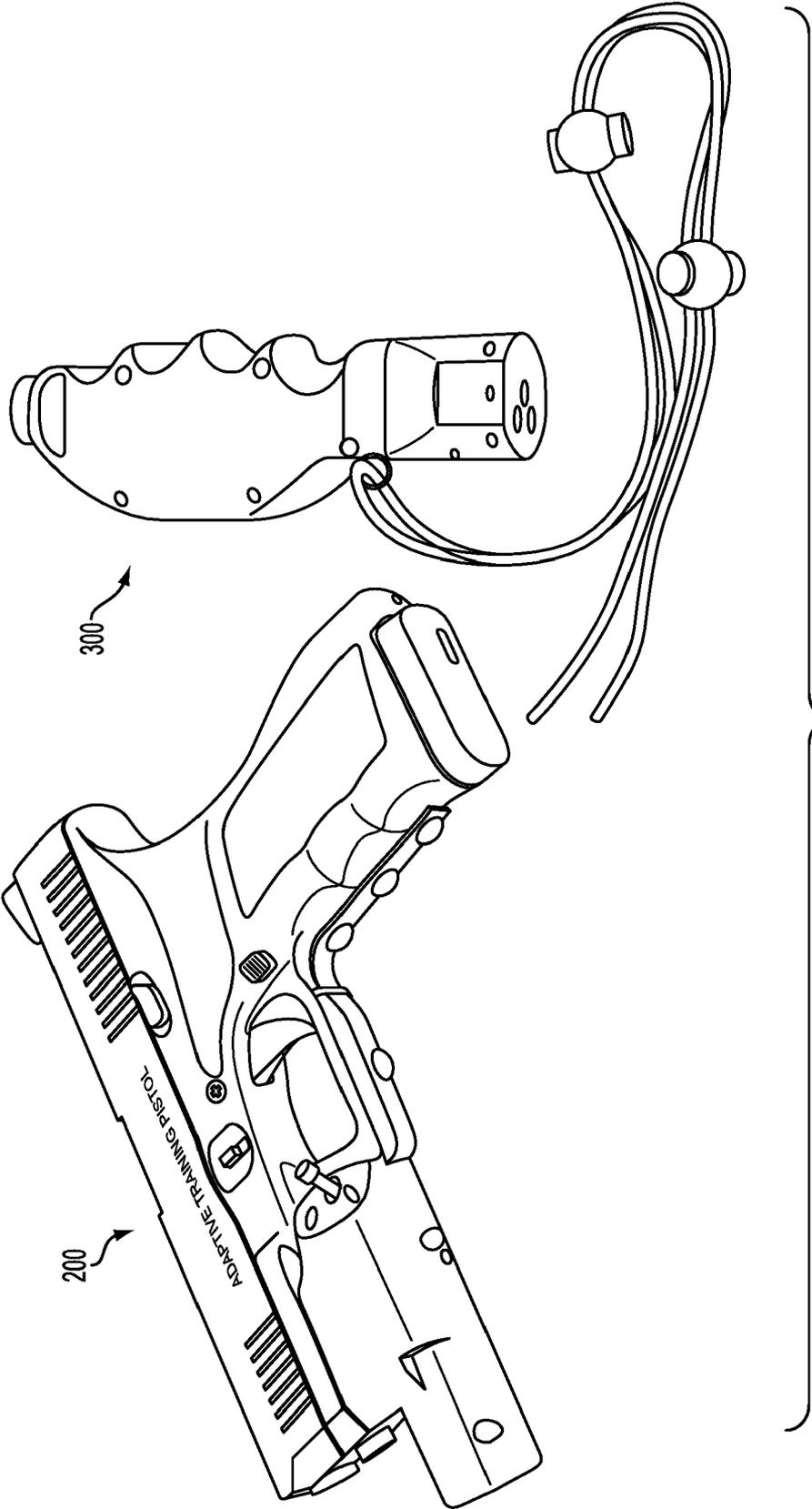


FIG. 15

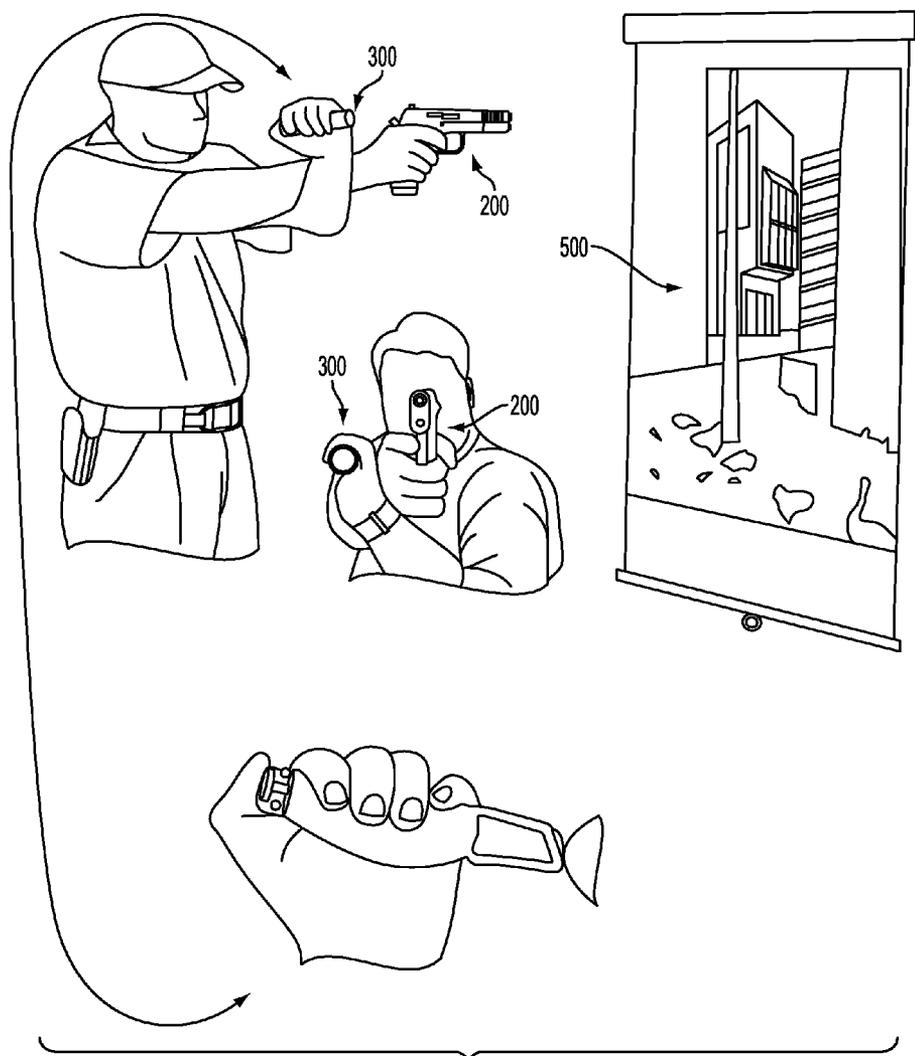


FIG. 16

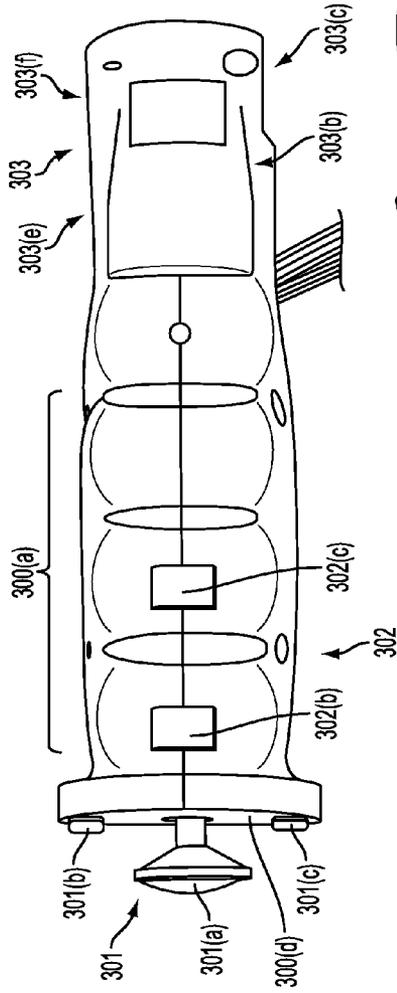


FIG. 17

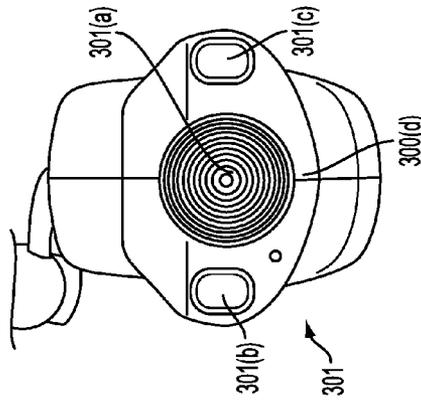


FIG. 18

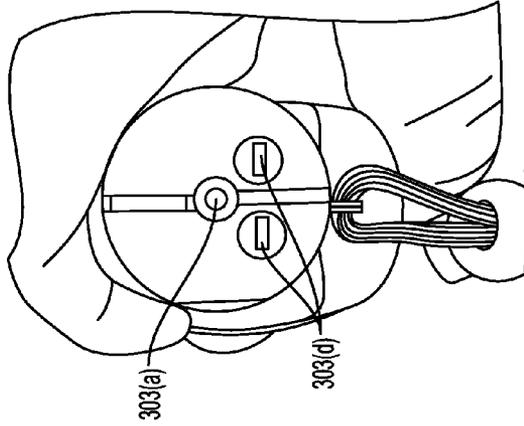


FIG. 19

**PROPER GRIP CONTROLLERS**

**CROSS-REFERENCE TO RELATED APPLICATIONS**

**[0001]** This application claims priority to and the benefit of co-pending U.S. patent application Ser. No. 11/285,390, filed Nov. 23, 2005, and entitled "Instructor-lead training environment and interfaces therewith," which claims priority to and the benefit of U.S. Provisional Patent Application No. 60/630,304, filed Nov. 24, 2004, and U.S. Provisional Patent Application No. 60/734,276, filed Nov. 8, 2005, the disclosures of which are herein incorporated by reference in their entirety for all purposes.

**COPYRIGHT NOTIFICATION**

**[0002]** This application includes material which is subject to copyright protection. The copyright owner has no objection to the facsimile reproduction by anyone of the patent disclosure, as it appears in the Patent and Trademark Office files or records, but otherwise reserves all copyright rights whatsoever.

**BACKGROUND OF THE INVENTION**

**[0003]** 1. Field of the Invention

**[0004]** Embodiments of the present invention relate to weapon mounted controllers. In some embodiments, the present invention relates to weapon mounted controllers that train a user on a proper weapon grip and allow the user to interact with a computer training simulation.

**[0005]** 2. Description of the Related Art

**[0006]** As computer simulations are increasingly used to train armed personnel, such as military recruits and police officers, there is an increasing need for weapon simulators and controllers that allow the trainees to interact with the computer simulations. Weapon-shaped controllers adapted from the video game industry have been proposed as training simulation controllers. However, as video game controllers are designed for the convenience of the user, ergonomic considerations, and ease of manufacturing, video game controllers fail at teaching proper grip techniques for weapons and other armed personnel equipment.

**SUMMARY OF THE INVENTION**

**[0007]** The present invention provides weapon and equipment controllers that allow a trainee to interact with a computer training simulation while teaching the proper grip of weapons and equipment.

**[0008]** The foregoing and/or other aspects and utilities of the present invention may be achieved by providing a proper grip controller, including a first controller disposed near a trigger, the first controller including a joystick, wherein the first controller is disposed such that a user of the proper grip controller can manipulate the joystick a thumb while properly holding the proper grip controller. In some embodiments of the invention the proper grip controller corresponds to a rifle and the first controller is disposed such that a user of the proper grip controller can manipulate the joystick with the thumb of his firing hand while properly holding the proper grip controller.

**[0009]** In some embodiments of the invention the proper grip controller corresponds to a pistol and the first controller is disposed such that a user of the proper grip controller can

manipulate the joystick with the thumb of his non-firing hand while properly holding the proper grip controller in a two-handed grip.

**[0010]** In some embodiments of the invention the proper grip controller corresponds to a flashlight and the first controller is disposed such that a user of the proper grip controller can manipulate the joystick with the thumb of his non-firing hand while properly holding the proper grip controller under the harries technique.

**BRIEF DESCRIPTION OF THE DRAWINGS**

**[0011]** These and/or other aspects and advantages of the present invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

**[0012]** FIG. 1 illustrates certain features of some embodiments of the present invention.

**[0013]** FIG. 2 illustrates certain features of some embodiments of the present invention.

**[0014]** FIG. 3 illustrates certain features of some embodiments of the present invention.

**[0015]** FIG. 4 illustrates certain features of some embodiments of the present invention.

**[0016]** FIG. 5 illustrates certain features of some embodiments of the present invention.

**[0017]** FIG. 6 illustrates certain features of some embodiments of the present invention.

**[0018]** FIG. 7 illustrates certain features of some embodiments of the present invention.

**[0019]** FIG. 8 illustrates certain features of some embodiments of the present invention.

**[0020]** FIG. 9 illustrates certain features of some embodiments of the present invention.

**[0021]** FIG. 10 illustrates certain features of some embodiments of the present invention.

**[0022]** FIG. 11 illustrates certain features of some embodiments of the present invention.

**[0023]** FIG. 12 illustrates certain features of some embodiments of the present invention.

**[0024]** FIG. 13 illustrates certain features of some embodiments of the present invention.

**[0025]** FIG. 14 illustrates certain features of some embodiments of the present invention.

**[0026]** FIG. 15 illustrates certain features of some embodiments of the present invention.

**[0027]** FIG. 16 illustrates certain features of some embodiments of the present invention.

**[0028]** FIG. 17 illustrates certain features of some embodiments of the present invention.

**[0029]** FIG. 18 illustrates certain features of some embodiments of the present invention.

**[0030]** FIG. 19 illustrates certain features of some embodiments of the present invention.

**[0031]** These figures constitute a part of this specification and include illustrative embodiments of the present invention and illustrate various objects and features thereof. The figures are not necessarily to scale, as emphasis is given in illustrating the principles of the present invention, and some features may be exaggerated to show details of particular components. In addition, any measurements, specifications, and the like shown in the figures are intended to be illustrative and not restrictive. Therefore, specific structural and functional details disclosed in these figures are not to be interpreted as

limiting, but merely as a representative basis for teaching one skilled in the art to how to employ the present invention under various embodiments.

#### DETAILED DESCRIPTION

**[0032]** Reference will now be made in detail to the various embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to the like elements throughout. The embodiments are described below to provide a more complete understanding of the components, processes and apparatuses of the present invention by referring to the figures. These figures are merely illustrative representations based on convenience and the ease of demonstrating the present invention, and are, therefore, not intended to indicate relative size and dimensions of the devices or components thereof or to define or limit the scope of the embodiments.

**[0033]** Throughout the specification and claims, the following terms take the meanings explicitly associated herein, unless the context clearly dictates otherwise. The phrases “in some embodiments” and “in an embodiment” as used herein do not necessarily refer to the same embodiment(s), though they may. Furthermore, the phrases “in another embodiment” and “in some other embodiments” as used herein do not necessarily refer to a different embodiment, although they may. Thus, as described below, various embodiments of the invention may be readily combined, without departing from the scope or spirit of the invention. In addition, as used herein, the term “or” is an inclusive “or” operator, and is equivalent to the term “and/or,” unless the context clearly dictates otherwise. The term “based on” is not exclusive and allows for being based on additional factors not described, unless the context clearly dictates otherwise. In addition, throughout the specification, the meaning of “a,” “an,” and “the” include plural references. The meaning of “in” includes “in” and “on.”

#### Proper Grip Rifle Controller

**[0034]** In one embodiment, the present invention provides a proper grip rifle controller. For example, as illustrated in FIG. 1, an embodiment of the present invention provides a proper grip rifle controller (100) to allow a trainee (1) to simulate movement within and interact with a computer generated training simulation (500).

**[0035]** In some embodiments, the training simulation (500) is a collaborative immersive virtual environment. In some embodiments, the training simulation (500) is an instructor-led computer generated training environment.

**[0036]** As illustrated in FIGS. 2-3, in some embodiments the proper grip rifle controller (100) may include at least one of a first controller (101), a second controller (102), a third controller (103), a laser component (104), and a weapon controller (105).

**[0037]** In some embodiments, the laser component (104) includes a laser (104a) and a laser controller (104b). In some embodiments, the weapon controller (105) includes a battery (105a) to power the electronic components of the proper grip rifle controller (100). In some embodiments, the weapon controller (105) includes a wireless transmitter (105b) and a wireless controller (105c) to communicate inputs made on the proper grip rifle controller (100) to the computer generated training simulation (500).

**[0038]** In some embodiments, the first controller (101), the second controller (102), and the third controller (103) control the navigation of the trainee (1) within the computer generated training simulation (500). In some embodiments, the first controller (101) and the second controller (102) can be used to adjust the point of view or view angle of the trainee (1) within the computer generated training simulation (500). In some embodiments, the first controller (101), the second controller (102), and the third controller (103) can also be used to simulate other functions within the simulation. For example the first controller (101), the second controller (102), and the third controller (103) can be used to throw a simulated grenade, jump, unjam a weapon, switch weapons, etc.

**[0039]** In some embodiments, the first controller (101), the second controller (102), and the third controller (103) are disposed on the proper grip rifle controller (100) to instruct the trainee (1) on the proper grip of a rifle-type weapon. For example, as illustrated in FIGS. 3-4, in some embodiments the first controller (101) is disposed adjacent to the trigger. When properly held, the trainee's firing hand is placed around a pistol grip (100a) of the proper grip rifle controller (100) in a position that allows the trainee's trigger finger to move a trigger (100b) straight to the rear while maintaining proper sight alignment and allowing the trainee to manipulate the first controller (101).

**[0040]** In some embodiments, the position of the first controller (101) allows the trainee (1) to manipulate a joystick (101a) with the thumb of his firing hand while properly holding the proper grip rifle controller (100). In some embodiments, the joystick (101a) protrudes backwards at an angle (A1) between 15° and 55° with respect to a central axis (Z) of the proper grip rifle controller (100). In other embodiments, the joystick (101a) protrudes backwards at an angle (A2) between 15° and 55° with respect to a perpendicular axis (P) defined by trigger (100b). In some embodiments, the angle (A1) or (A2) of the joystick (101a) is between 40° and 50°. In some embodiments, the angle (A1) or (A2) of the joystick (101a) is 45°. In some embodiments, the angle (A1) or (A2) is adjustable. In some embodiments, the joystick (101a) protrudes backwards at an angle (A3) between 15° and 55° with respect to an axis (Z2) perpendicular to the axis (Z) anchored on a bottom of the trigger (100b). In some embodiments, the angle (A3) is between 40° and 50°. In some embodiments, the angle (A3) is 45°. In some embodiments, the angle (A3) is adjustable.

**[0041]** In some embodiments, the joystick (101a) protrudes between 2 mm and 25 mm (D1) backwards from the perpendicular axis (P) to allow the trainee to manipulate the joystick (101a) with his thumb while properly holding the proper grip rifle controller (100). In other embodiments, the distance that the joystick (101a) protrudes backward is adjustable.

**[0042]** In some embodiments of the invention, a proper grip of the proper grip rifle controller (100) requires that the trainee's trigger finger be allowed free movement when the trainee's firing hand is placed around a pistol grip (100a). As illustrated in FIG. 4, in some embodiments, the first controller (101) includes a third button (101d) disposed on a front facing surface of the first controller (101). The position of the first controller (101) allows the trainee to manipulate the third button (101d) with his trigger finger while properly holding the proper grip rifle controller (100). In some embodiments, the trainee is made to push the third button (101d) to indicate that his trigger finger has free movement while his firing hand

is properly placed around the pistol grip (100a). In some embodiments, the third button (101d) is aligned with the perpendicular axis (P).

**[0043]** In some embodiments, the first controller (101) includes one or more buttons along with the joystick (101a). In other embodiments, one or more buttons replace the joystick (101a). For example, as illustrated in FIG. 5, the first controller (101) can include a first side button (101b) disposed on a back facing surface of the first controller (101). In some embodiments, the first side button (101b) is between 0.1 mm and 3 mm in height. In some embodiments, the first side button (101b) is between 1.5 mm and 2.0 mm in height. In some embodiments, the back facing surface has a same angle (A1), (A2), or (A3) as the joystick (101a). In some embodiments, the angle of the back facing surface is adjustable. In other embodiments, the joystick (101a) and the first side button (101b) are disposed on the same back facing surface of the first controller (101).

**[0044]** In some embodiments, the position of the first side button (101b) allows the trainee (1) to press the first side button (101b) with the thumb of his firing hand while properly holding the proper grip rifle controller (100).

**[0045]** In some embodiments, the back facing surface protrudes between 2 mm and 25 mm (D2) backwards from the from the perpendicular axis (P) to allow the trainee to press the first side button (101b) with his thumb while properly holding the proper grip rifle controller (100). In other embodiments, the distance that the back facing surface protrudes is adjustable.

**[0046]** As illustrated in FIGS. 3-4, in some embodiments, the second controller (102) is disposed along a barrel (100c) of the proper grip rifle controller (100). When properly held, the trainee's non-firing hand is placed on an upper hand guard (100d) of the proper grip rifle controller (100) in a position that allows the trainee's thumb to manipulate the second controller (102) while supporting the proper grip rifle controller (100).

**[0047]** In some embodiments, the position of the second controller (102) allows the trainee to manipulate a joystick (102a) with the thumb of his non-firing hand while properly holding the proper grip rifle controller (100). In some embodiments, the joystick (102a) protrudes perpendicular from the central axis (Z) of the proper grip rifle controller (100). In other embodiments, the joystick (102a) protrudes at an angle (A4) between 0° and 45° with respect to a perpendicular line (P) from the central axis (Z). In other embodiments, the joystick (102a) protrudes at an angle (A5) between 80° and 100° with respect to the central axis (Z). In other embodiments, the angles of the joystick (102a) are adjustable.

**[0048]** In some embodiments, the joystick (102a) protrudes between 2 mm and 25 mm (D3) perpendicular from the surface of the hand guard (100d) to allow the trainee to manipulate the joystick (102a) with his thumb while properly holding the proper grip rifle controller (100). In other embodiments, the distance that the joystick (102a) protrudes perpendicular from the surface of the hand guard (100d) is adjustable.

**[0049]** In some embodiments, the second controller (102) includes one or more buttons along with the joystick (102a). In other embodiments, one or more buttons replace the joystick (102a). For example, as illustrated in FIG. 6, the second controller (102) can include a first side button (102b) disposed on an out facing surface of the second controller (102). In some embodiments, the first side button (102b) is between

0.1 mm and 3 mm in height. In some embodiments, the first side button (102b) is between 1.5 mm and 2.0 mm in height. In some embodiments, the out facing surface has the same angle as the joystick (102a). In other embodiments, the joystick (102a) and the first side button (102b) are disposed on the same out facing surface of the second controller (102). In some embodiments, the position of the first side button (101b) allows the trainee (1) to press the first side button (101b) with the thumb of his non-firing hand while properly holding the proper grip rifle controller (100).

**[0050]** In some embodiments, the out facing surface protrudes between 2 mm and 25 mm (D4) perpendicular from the surface of the hand guard (100d) to allow the trainee to press the first side button (102b) with his thumb while properly holding the proper grip rifle controller (100). In other embodiments, the distance that the out facing surface protrudes is adjustable. In other embodiments, the angles of the out facing surface are adjustable.

**[0051]** As illustrated in FIGS. 1 and 7, in some embodiments the third controller (103) is disposed along the barrel (100c) of the proper grip rifle controller (100). When properly held, the trainee's non-firing hand is placed on the upper hand guard (100d) of the proper grip rifle controller (100) in a position that allows the trainee's non-firing fingers to manipulate the third controller (103) while supporting the proper grip rifle controller (100).

**[0052]** In some embodiments, the third controller (103) includes one or more buttons. For example, as illustrated in FIG. 7, the third controller (103) includes a first chord button (103a), a second chord button (103b), a third chord button (103c), and a fourth chord button (103d) disposed on an out facing surface of the third controller (103). In some embodiments, the first chord button (103a), the second chord button (103b), the third chord button (103c), and the fourth chord button (103d) are between 0.1 mm and 5 mm in height. In some embodiments, the first chord button (103a), the second chord button (103b), the third chord button (103c), and the fourth chord button (103d) are between 1.5 mm and 2 mm in height. In some embodiments, the third controller (103) is disposed on an opposite side of the proper grip rifle controller (100) from the second controller (102).

**[0053]** In some embodiments, the position of third controller (103) allows the trainee to press the first, second, third, and fourth chord buttons (103a, 103b, 103c, and 103d) with the fingers of his non-firing hand while properly holding the proper grip rifle controller (100). In some embodiments, the trainee can press combinations or chords of the first, second, third, and fourth chord buttons (103a, 103b, 103c, and 103d) to trigger specific instructions.

**[0054]** In some embodiments, the third controller (103) is disposed a predetermined distance (D5) from the end of the barrel (100c) to correspond with an edge of the upper hand guard 100d. In some embodiments, the position of the third controller (103) corresponds to a proper placement of the trainee's (1) non-firing hand fingers on the barrel (100c) according to the type of weapon represented by the proper grip rifle controller (100). In some embodiments, the position of the third controller (103) is adjustable. In some embodiments, the first, second, third, and fourth chord buttons (103a, 103b, 103c, and 103d) are between 10 mm and 20 mm apart from each other. In some embodiments, the distance between the first, second, third, and fourth chord buttons (103a, 103b, 103c, and 103d) corresponds to a general distance between a

trainees non-firing fingers to allow manipulation of the third controller (103) while maintaining proper grip of the proper grip rifle controller (100).

[0055] In some embodiments, an outward surface of the third controller (103) protrudes at an angle (A6) from a perpendicular line (P) of the central axis (Z). In some embodiments, the angle (A6) is between 10° and 60° with respect to the perpendicular line (P). In some embodiments, the angle (A6) is between 30° and 50° with respect to the perpendicular line (P). In some embodiments, the angle (A6) is 45°. In other embodiments, the angle (A6) is adjustable.

[0056] While FIGS. 1-7 illustrate embodiments of the present invention where the proper grip rifle controller (100) is embodied as a M15A4 rifle, the present invention is not limited thereto. Instead, the present invention can also be embodied as other type of rifle-like weapons. For example, FIG. 9 illustrates an embodiment of the present invention where controllers A, B, and C, are disposed on a proper grip M4 controller (M4) to instruct the trainee (1) on the proper grip of a M4 weapon. Similarly, FIG. 10 illustrates an embodiment where controllers A, B, and C, are disposed on a proper grip M4-M203 controller (M4-M203) to instruct the trainee (1) on the proper grip of a M4-M203 weapon, and FIG. 11 illustrates an embodiment where controllers A, B, and C, are disposed on a proper grip M249 controller (M249) to instruct the trainee (1) on the proper grip of a M249 weapon.

#### Proper Grip Pistol Controller

[0057] In another embodiment, the present invention provides a proper grip pistol controller. For example, as illustrated in FIG. 8, an embodiment of the present invention provides a proper grip pistol controller (200) to allow a trainee (1) to simulate movement within and interact with a computer generated training simulation (500).

[0058] As illustrated in FIGS. 8, 12-14, in some embodiments, the proper grip pistol controller (200) may include at least one of a first controller (201), a second controller (202), and a weapon controller (203).

[0059] In some embodiments, the weapon controller (203) includes a laser (203a) and a laser controller (203b). In some embodiments, the weapon controller (203) includes a battery (203c) to power the electronic components of the proper grip pistol controller (200) and battery contacts (203d) to allow recharging of the battery. In some embodiments, the weapon controller (203) includes a wireless transmitter (203e) and a wireless controller (203f) to communicate inputs made on the proper grip pistol controller (200) to the computer generated training simulation (500).

[0060] In some embodiments, the first controller (201) and the second controller (202) control the navigation of the trainee (1) within the computer generated training simulation (500). In some embodiments, the first controller (201) and the second controller (202) can be used to adjust the point of view or view angle of the trainee (1) within the computer generated training simulation (500). In some embodiments, the first controller (201) and the second controller (202) can also be used to simulate other functions within the simulation. For example, the first controller (201) and the second controller (202) can be used to throw a simulated grenade, jump, unjam a weapon, switch weapons, etc.

[0061] In some embodiments, the first controller (201) and the second controller (202) are disposed on the proper grip pistol controller (200) to instruct the trainee (1) on the proper

two-handed grip of a pistol-type weapon. For example, in some embodiments the first controller (201) is disposed forward of the trigger (200b) and the second controller is disposed along a pistol grip (200a) of the proper grip pistol controller (200). When properly held, the trainee's firing hand is placed around the pistol grip (200a) in a position that allows the trainee's trigger finger to move a trigger (200b) straight to the rear while maintaining proper sight alignment, allows the trainee's fingers to manipulate the second controller (202), and allows the thumb of the trainee's firing hand to engage a safety switch (200d), if present. When properly held in a two-handed grip, the heel of the non-firing hand is placed on the exposed portion of the pistol grip (200a), and the fingers of the non-firing hand are wrapped around the fingers of the firing hand already around the pistol grip (200a) such that both thumbs rest on the same side of the proper grip pistol controller (200) and the trainee can use the thumb of his non-firing hand to manipulate the first controller (201).

[0062] In some embodiments, the position of the first controller (201) allows the trainee to manipulate a joystick (201a) with the thumb of his non-firing hand while properly holding the proper grip pistol controller (200). In some embodiments, the joystick (201a) protrudes backwards at an angle (A8) between 15° and 55° with respect to a central axis (Z) of the proper grip pistol controller (200). In some embodiments, the angle (A8) of the joystick (201a) is between 40° and 50°. In some embodiments, the angle (A8) of the joystick (201a) is 45°. In some embodiments, the angle (A8) of the joystick (201a) is adjustable.

[0063] In some embodiments, the joystick (201a) protrudes between 2 mm and 25 mm (D7) backwards from a perpendicular axis (P2) defined by a forward boundary of the trigger (200b) to allow the trainee to manipulate the joystick (201a) with his thumb while properly holding the proper grip pistol controller (200). In other embodiments, the height of the joystick (201a) is 10 mm. In other embodiments, the distance that the joystick (201a) protrudes backward is adjustable.

[0064] In some embodiments, the first controller (201) includes one or more buttons along with the joystick (201a). In other embodiment, one or more buttons replace the joystick (201a). For example, the first controller (201) can include a first side button (201b) and a second side button (201c) disposed on a back facing surface of the first controller (201). In some embodiments the first and second side buttons (201b and 201c) are between 0.1 mm and 5 mm in height. In some embodiments, the back facing surface has a corresponding angle (A9) to the angle (A8) of the joystick (201a). In other embodiments, the joystick (201a) and the first and second side buttons (201b and 201c) are disposed on the same back facing surface of the first controller (201). In some embodiments, the angles (A8) and (A9) are adjustable

[0065] In some embodiments, the position of the first and second side buttons (201b and 201c) allows the trainee (1) to press either the first side button (201b) and the second side button (201c) with the thumb of his non-firing hand while properly holding the proper grip pistol controller (200).

[0066] As illustrated in FIGS. 8, 12-14, in some embodiments, the second controller (202) is disposed along the pistol grip (200a) of the proper grip pistol controller (200). When properly held, the trainee's firing hand is placed around the pistol grip (200a) in a position that allows the trainee's fingers to manipulate the second controller (202) while stabilizing the sights and allowing the sights to align with the trainee's aiming eye.

[0067] In some embodiments, the second controller (202) includes one or more buttons. For example, the second controller (202) includes a first button (202a), a second button (202b), a third button (202c), and a fourth button (202d).

[0068] In some embodiments, the first button (202a) is disposed underneath a trigger (200b) of the proper grip pistol controller (200). The position of first button (202a) along the second controller (202) and underneath the trigger (200b) allows the trainee (1) to manipulate the first button (202a) with the index finger of his non-firing hand while properly holding the proper grip pistol controller (200). In some embodiments, the trainee (1) is made to push the first button (202a) to indicate that his non-firing index finger is not in front of the trigger guard.

[0069] In some embodiments, the second button (202b), the third button (202c), and the fourth button (202d) are disposed on the second controller (202) along the pistol grip (200b). The position of the second button (202b), the third button (202c), and the fourth button (202d) along the pistol grip (200b) allows the trainee to manipulate the second button (202b), the third button (202c), and the fourth button (202d) with the middle, third, and little finger of his firing hand while properly holding the proper grip pistol controller (200).

[0070] In some embodiments, the first button (202a), the second button (202b), the third button (202c), and the fourth button (202d) are between 0.1 mm and 3 mm in height. In some embodiments, the first button (202a), the second button (202b), the third button (202c), and the fourth button (202d) are between 1.5 mm and 2.0 mm in height. In some embodiments, the first button (202a), the second button (202b), the third button (202c), and the fourth button (202d) are tape pressure switches. In some embodiments, the first button (202a), the second button (202b), the third button (202c), and the fourth button (202d) provide tactile feedback on a proper grip of the proper grip pistol controller (200). In some embodiments, the first button (202a), the second button (202b), the third button (202c), and the fourth button (202d) are wrapped in heat shrink for protection of the buttons and their flex circuitry. In some embodiments, the buttons of the second controller (202) are shaped so that they do not interfere with a proper holding of the proper grip pistol controller (200) while allowing use of a holster.

[0071] In some embodiments, the second button (202b) is disposed between 10 mm and 20 mm below a lower edge of the trigger (200b). In some embodiments, the third button (202c) is disposed between 10 mm and 20 mm below the second button (202b). In some embodiments, the fourth button (202d) is disposed between 10 mm and 20 mm below the third button (202c). In some embodiments, the position of the second button (202b) corresponds to a proper placement of the trainee's (1) middle finger on the pistol grip (200a). In other embodiments, the third button (202c) and the fourth button (202d) are disposed to correspond to the proper position of the trainee's (1) third and little finger under a proper two-handed grip of the proper grip pistol controller (200). In some embodiments, the position of the first button (202a), the second button (202b), the third button (202c), and the fourth button (202d) are adjustable.

[0072] While FIGS. 8, 12-14 illustrate embodiments of the present invention where the proper grip pistol controller (100) is embodied as a M9 semiautomatic pistol, the present invention is not limited thereto. Instead, the present invention can also be embodied as other type of pistols, including revolvers and machine pistols.

#### Proper Grip Harries Controller

[0073] In another embodiment, the present invention provides a proper grip harries controller. For example, as illustrated in FIGS. 15-19, an embodiment of the present invention provides a proper grip pistol controller (200) and a proper grip harries controller (300) to allow a trainee (1) to simulate movement within and interact with a computer generated training simulation (500) while instructing the trainee (1) on the proper harries technique.

[0074] As illustrated in FIGS. 15-19, in some embodiments, the proper grip harries controller (300) may include at least one of a first controller (301) a second controller (302), and a harries controller (303).

[0075] In some embodiments, the harries controller (303) includes a laser (303a) and a laser controller (303b). In some embodiments, the harries controller (303) includes a battery (303c) to power the electronic components of the proper grip harries controller (300) and battery contacts (303d) to allow recharging of the battery (303c). In some embodiments, the harries controller (303) includes a wireless transmitter (303e) and a wireless controller (303f) to communicate inputs made on the proper grip harries controller (300) to the computer generated training simulation (500).

[0076] In some embodiments, the first controller (301) and the second controller (302) control the navigation of the trainee (1) within the computer generated training simulation (500). In some embodiments, the first controller (301) and the second controller (302) can be used to adjust the point of view or view angle of the trainee (1) within the computer generated training simulation (500). In some embodiments, the first controller (301) and the second controller (302) can also be used to simulate other functions within the simulation. For example, the first controller (301) and the second controller (302) can be used to throw a simulated grenade, jump, switch equipment, etc.

[0077] In some embodiments, the first controller (301) and the second controller (302) are disposed on the proper grip harries controller (300) to instruct the trainee (1) on the proper grip of a flashlight-type device when employing the harries technique. For example, in some embodiments the first controller (301) is disposed on a base (300d) of proper grip harries controller (300) and the second controller is disposed along a grip (300a) of the proper grip harries controller (300). As illustrated in FIGS. 15-19, when properly held, the trainee's firing hand controls the proper grip pistol controller (200) and the trainee's non-firing hand is placed around the grip (300a) of proper grip harries controller (300) in a position that allows the trainee's non-firing fingers to manipulate the second controller (302) and allows the thumb of the trainee's non-firing hand to manipulate the first controller (301) while maintaining a proper grip of a flashlight type device when employing the harries technique.

[0078] In some embodiments, the position of the first controller (301) allows the trainee to manipulate a joystick (301a) with the thumb of his non-firing hand while properly holding the proper grip harries controller (300). In some embodiments, the joystick (301a) protrudes perpendicular from the base (300d) of the proper grip harries controller (300). In some embodiments, the angle of the joystick (301a) is adjustable.

[0079] In some embodiments, the joystick (301a) protrudes between 2 mm to 25 mm from the base (300d) of the proper grip harries controller (300) to allow the trainee to manipulate the joystick (301a) with his thumb while properly holding the

proper grip harries controller (300). In other embodiments, the distance that the joystick (301a) protrudes is adjustable.

[0080] In some embodiments, the first controller (301) includes one or more buttons along with the joystick (301a). In other embodiment, one or more buttons replace the joystick (301a). For example, the first controller (301) can include a first side button (301b) and second side button (301c) disposed on the base (300d) of the proper grip harries controller (300). In some embodiments, the joystick (301a) and the first and second side buttons (301b and 301c) are disposed on the same surface of the base (300d) of the proper grip harries controller (300). In some embodiments the first and second side buttons (301b and 301c) are between 0.1 mm and 5 mm in height.

[0081] In some embodiments, the position of the first and second side buttons (301b and 301c) allows the trainee to press either the first side button (301b) and the second side button (301c) with the thumb of his non-firing hand while properly holding the proper grip harries controller (300).

[0082] As illustrated in FIGS. 15-18, in some embodiments, the second controller (302) is disposed along the grip (300a) of the proper grip harries controller (300). When properly held, the trainee's non-firing hand is placed around the grip (300a) in a position that allows the trainee's non-firing hand fingers to manipulate the second controller (302), allows the trainee's non-firing thumb to manipulate the first controller (301), and positions the proper grip harries controller (300) in an overhand grip proper for the harries technique.

[0083] In some embodiments, the second controller (302) includes one or more buttons. For example, as illustrated in FIG. 16, the second controller (302) includes a first button (302b) and a second button (302c).

[0084] In some embodiments, the first button (302b) and the second button (302c) are disposed on the grip (300b). The position of the first button (302b) and the second button (302c) along the grip (300b) allows the trainee (1) to manipulate the first button (302b) and the second button (302c) with the index and middle fingers of the trainee's non-firing hand while properly holding the proper grip harries controller (300).

[0085] In some embodiments, the first button (302b) is disposed between 10 mm and 30 mm below the outward surface of the base (300d) and the second button (302c) is disposed between 10 mm and 30 mm below the first button (302b). In some embodiments the first and second buttons (302b and 302c) are between 0.1 mm and 3 mm in height.

[0086] Although a few embodiments of the present invention have been shown and described, it will be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the present invention, the scope of which is defined in the appended claims and their equivalents.

What is claimed is:

- 1. A proper grip controller, comprising:
  - a first controller disposed near a trigger, the first controller comprising a joystick,
  - wherein the first controller is disposed such that a user of the proper grip controller can manipulate the joystick with a thumb while properly holding the proper grip controller.
- 2. The proper grip controller of claim 1, wherein the proper grip controller corresponds to a rifle, and
  - wherein the first controller is disposed such that a user of the proper grip controller can manipulate the joystick with the thumb of his firing hand while properly holding the proper grip controller.
- 3. The proper grip controller of claim 1, wherein the proper grip controller corresponds to a pistol, and
  - wherein the first controller is disposed such that a user of the proper grip controller can manipulate the joystick with the thumb of his non-firing hand while properly holding the proper grip controller in a two-handed grip.
- 4. The proper grip controller of claim 1, wherein the proper grip controller corresponds to a flashlight, and
  - wherein the first controller is disposed such that a user of the proper grip controller can manipulate the joystick with the thumb of his non-firing hand while properly holding the proper grip controller under the harries technique.

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