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(54) **GRIP AIMING DEVICE FOR WEAPONS**

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(57) **ABSTRACT**

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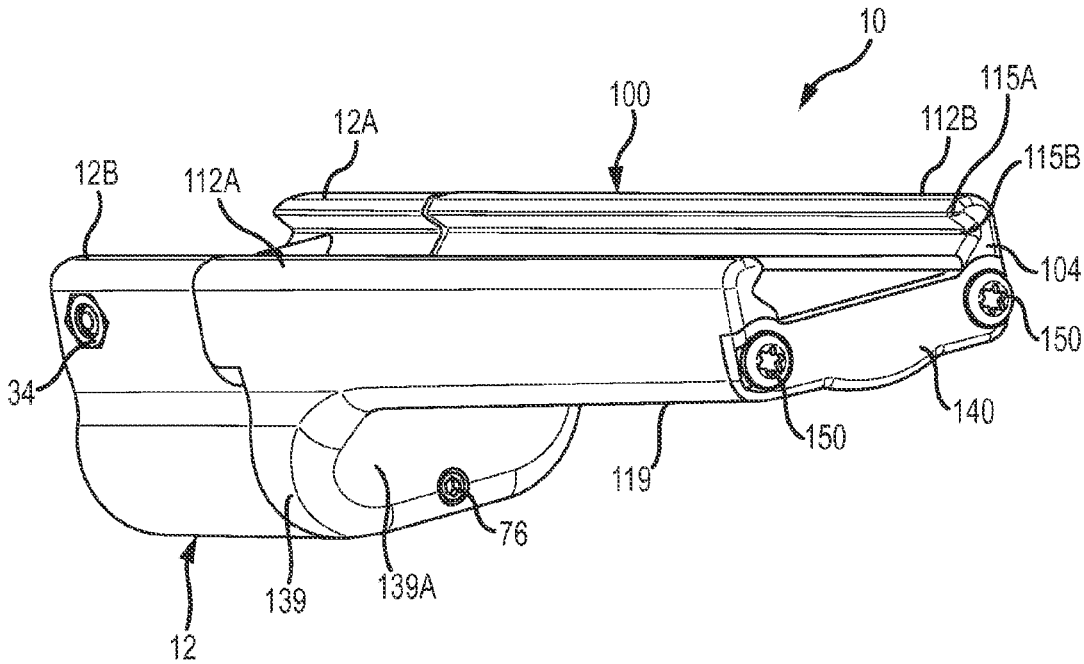
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A gun sighting device includes a grip and is mounted to the side of the gun. The grip has a compressible touch pad that is positioned such that a user's fingers are adjacent to, or on, the compressible touch pad when the user's hand is in the natural position of supporting the gun. The compressible touch pad can be compressed by the user's fingers to activate a light source while the user is holding the gun in the firing position, and without the user having to move his/her hand from supporting the gun or from the gun trigger.



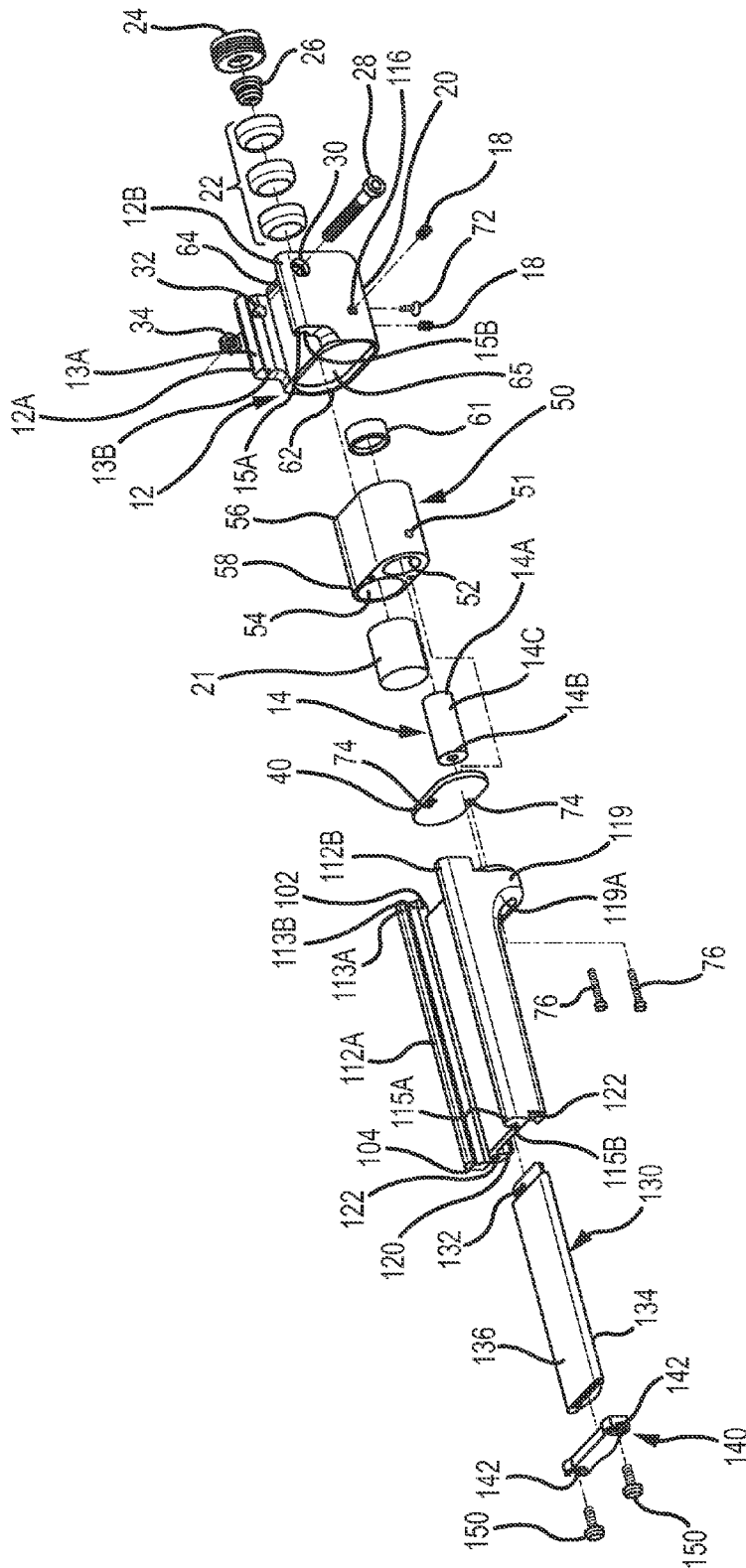


FIG.1

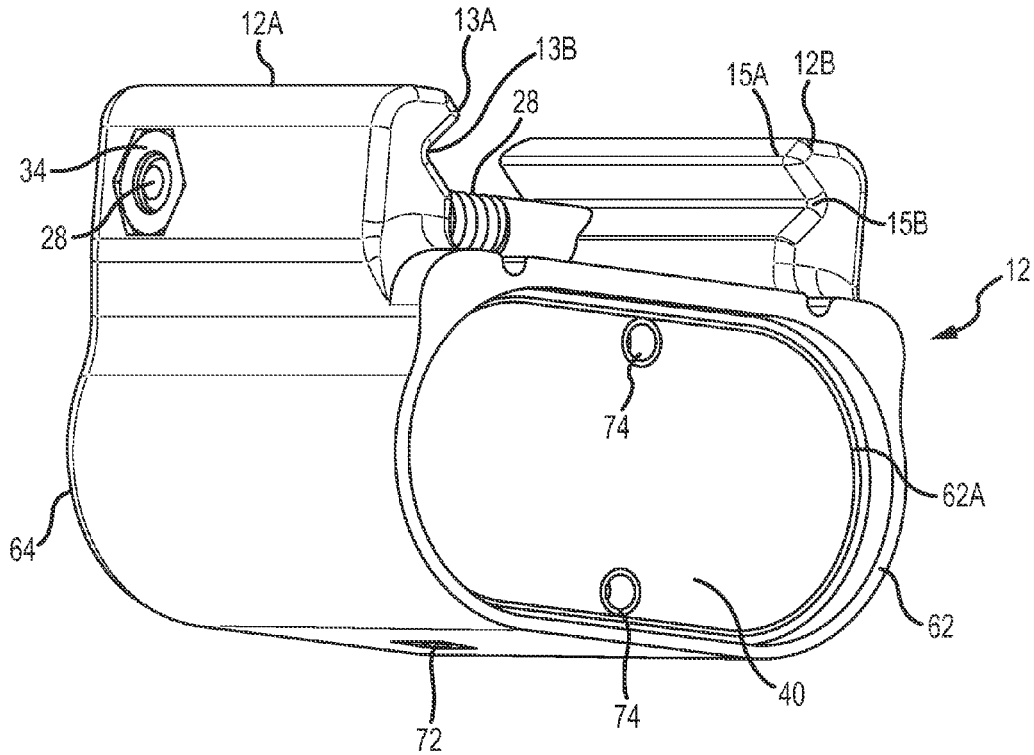


FIG. 2

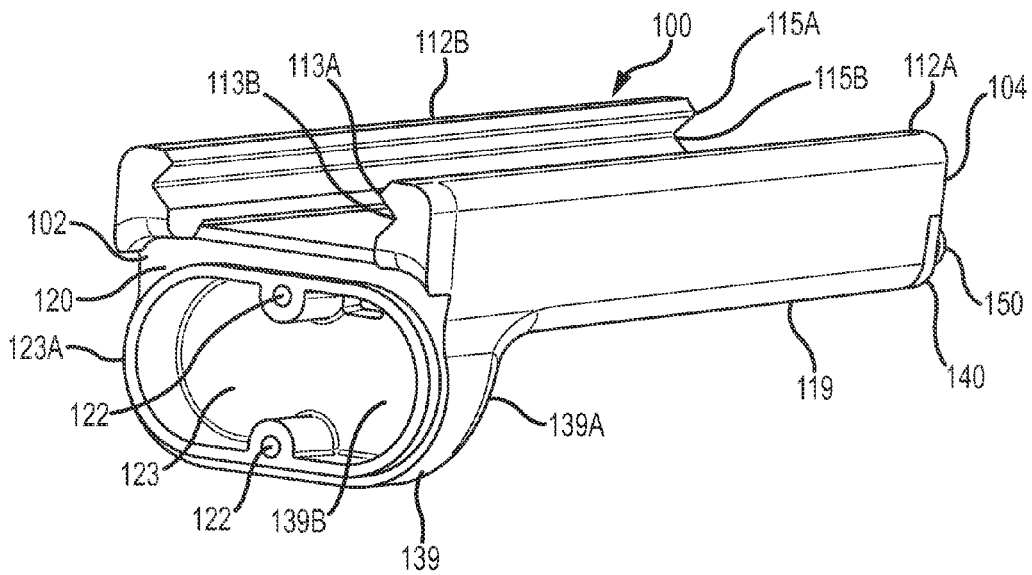


FIG. 3

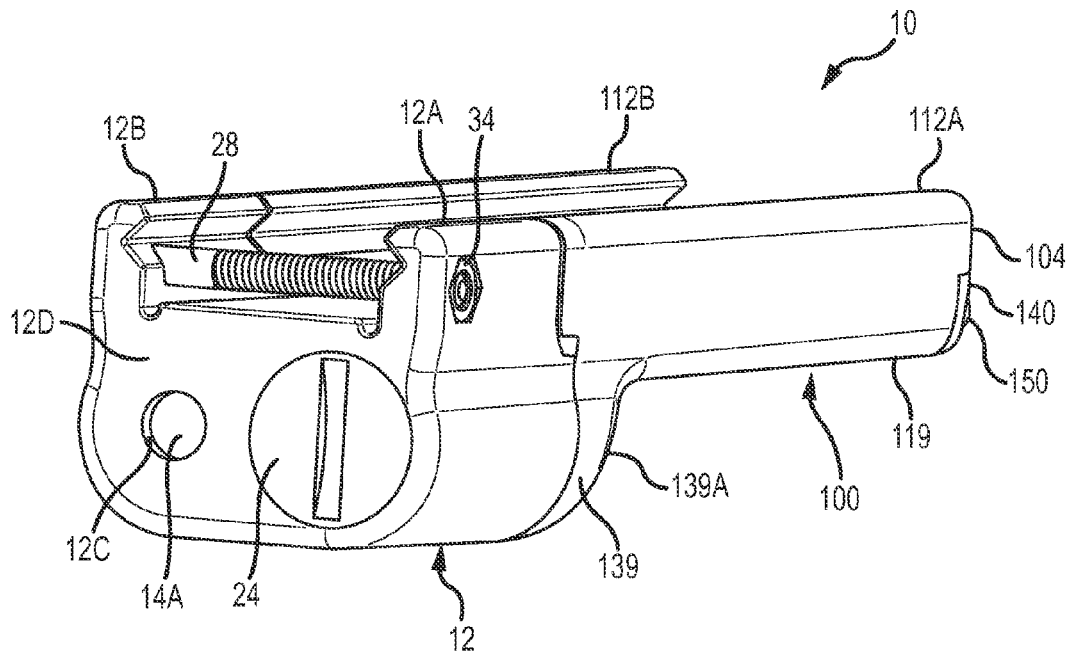


FIG. 4

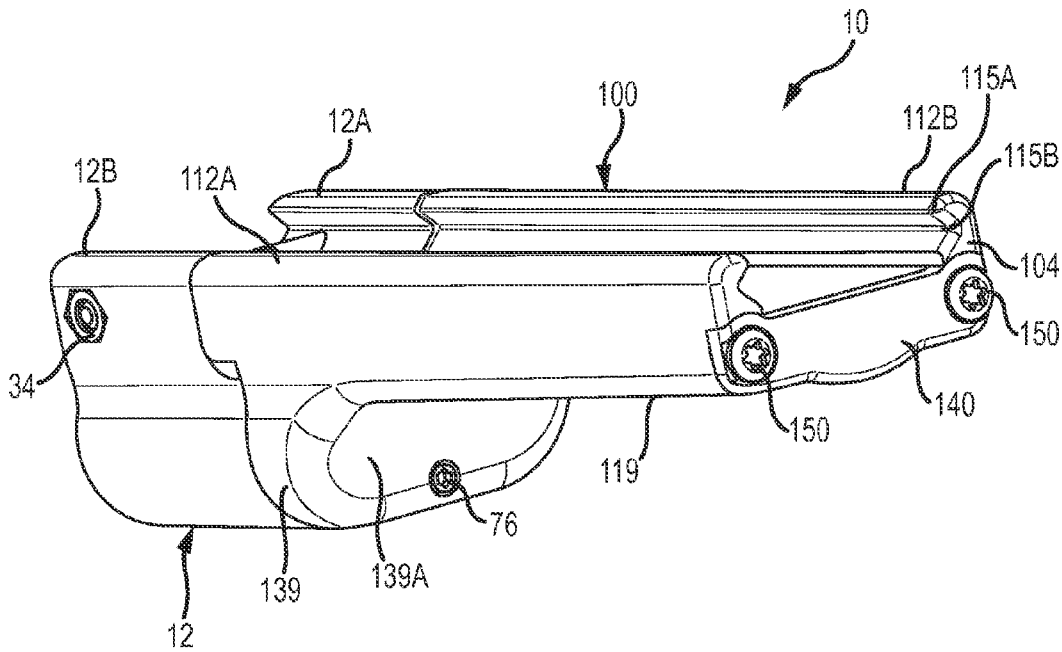


FIG. 5

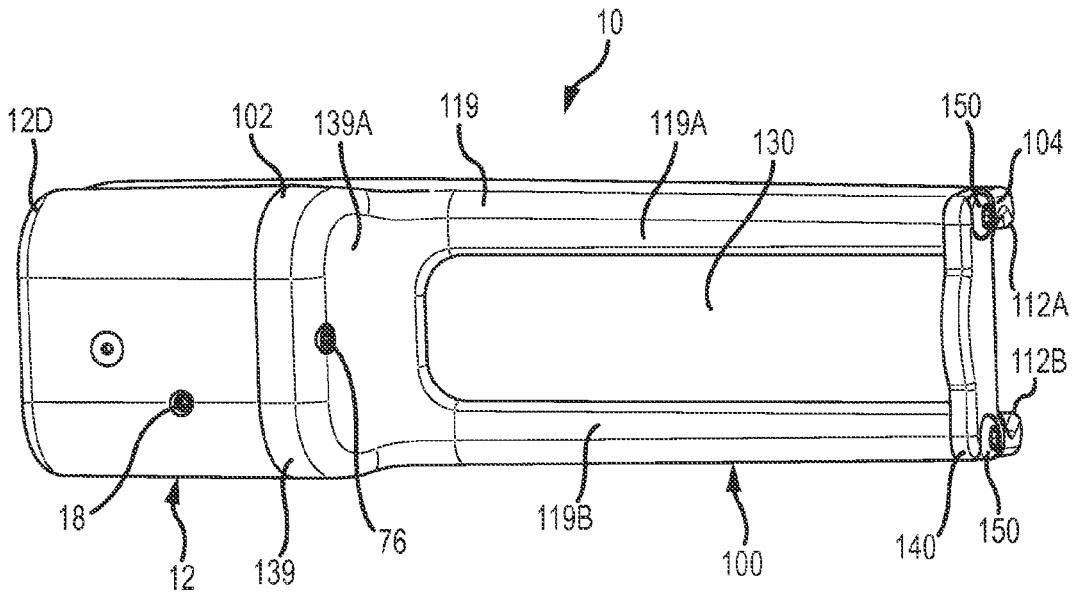


FIG. 6

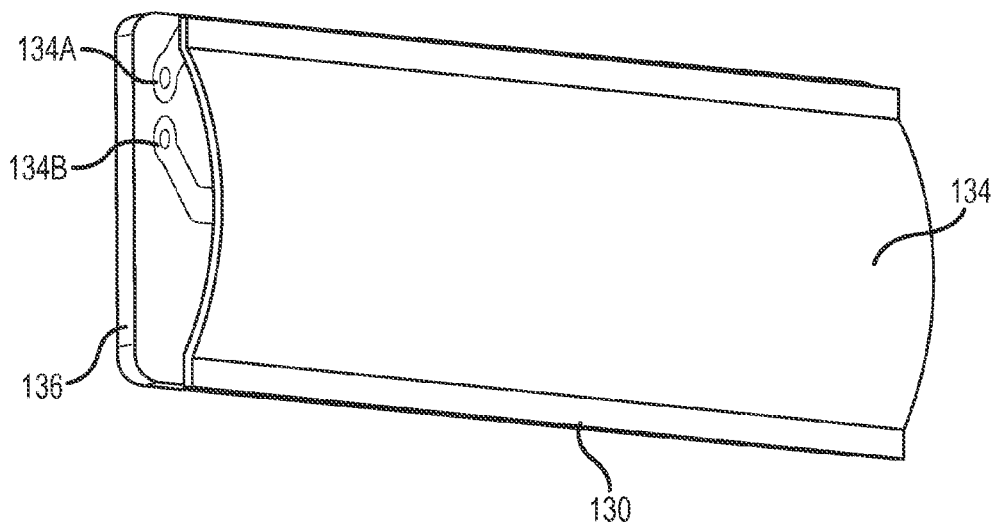


FIG. 7

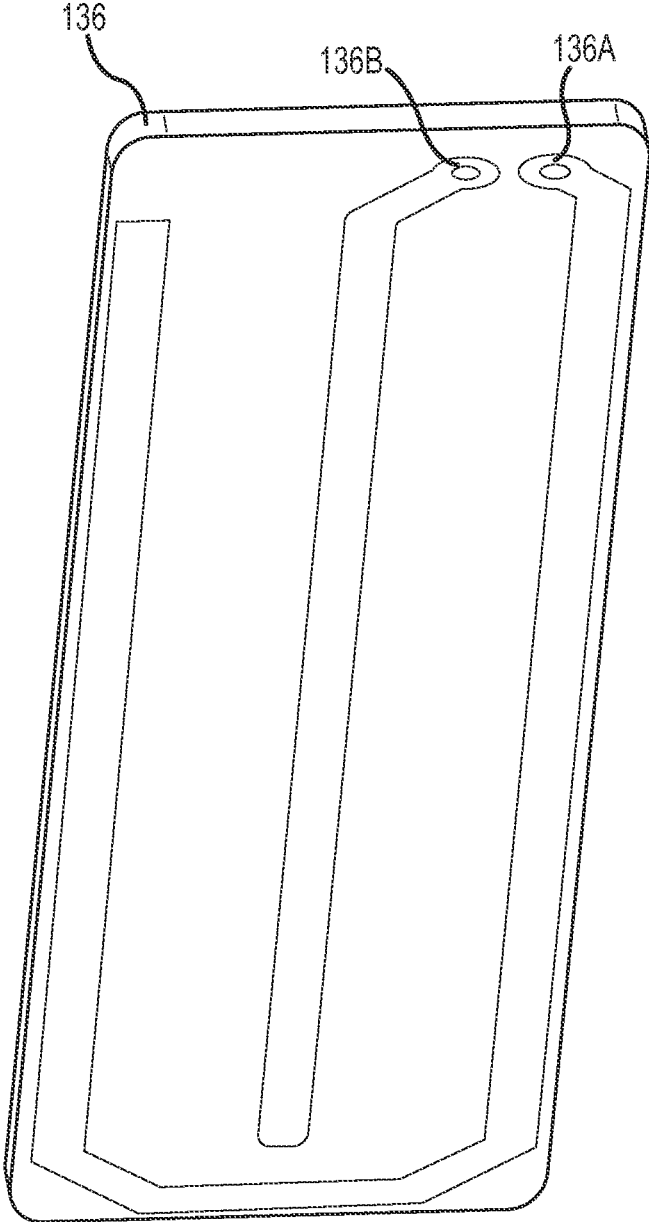


FIG.7A

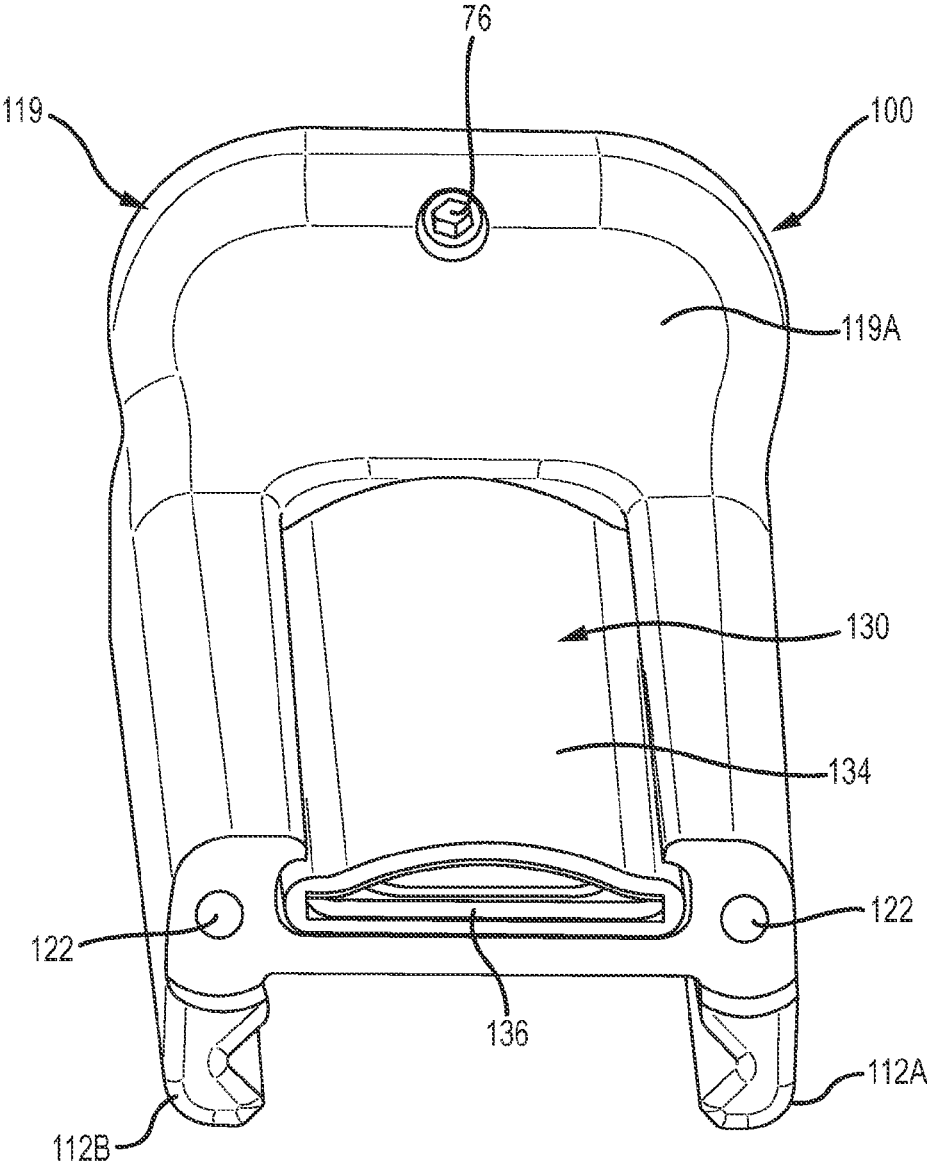


FIG. 8

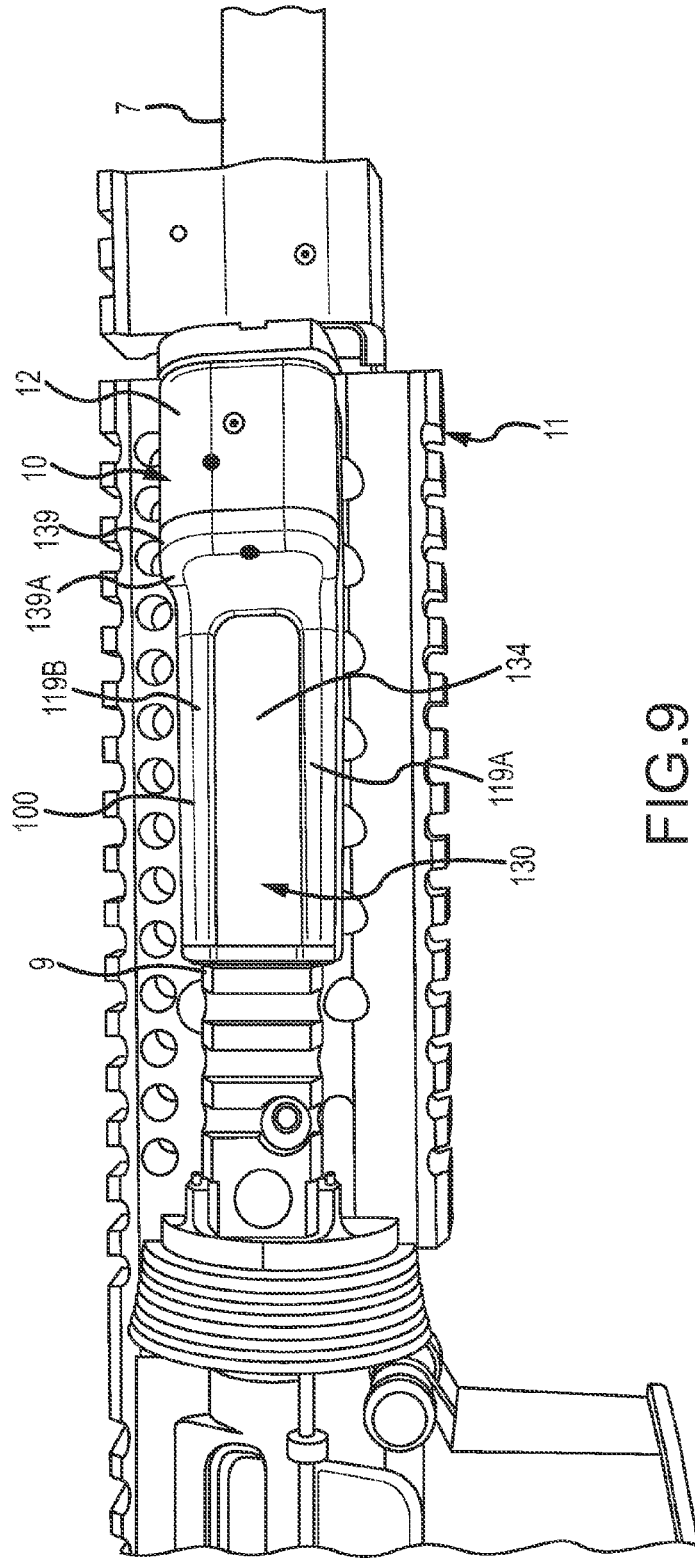


FIG. 9

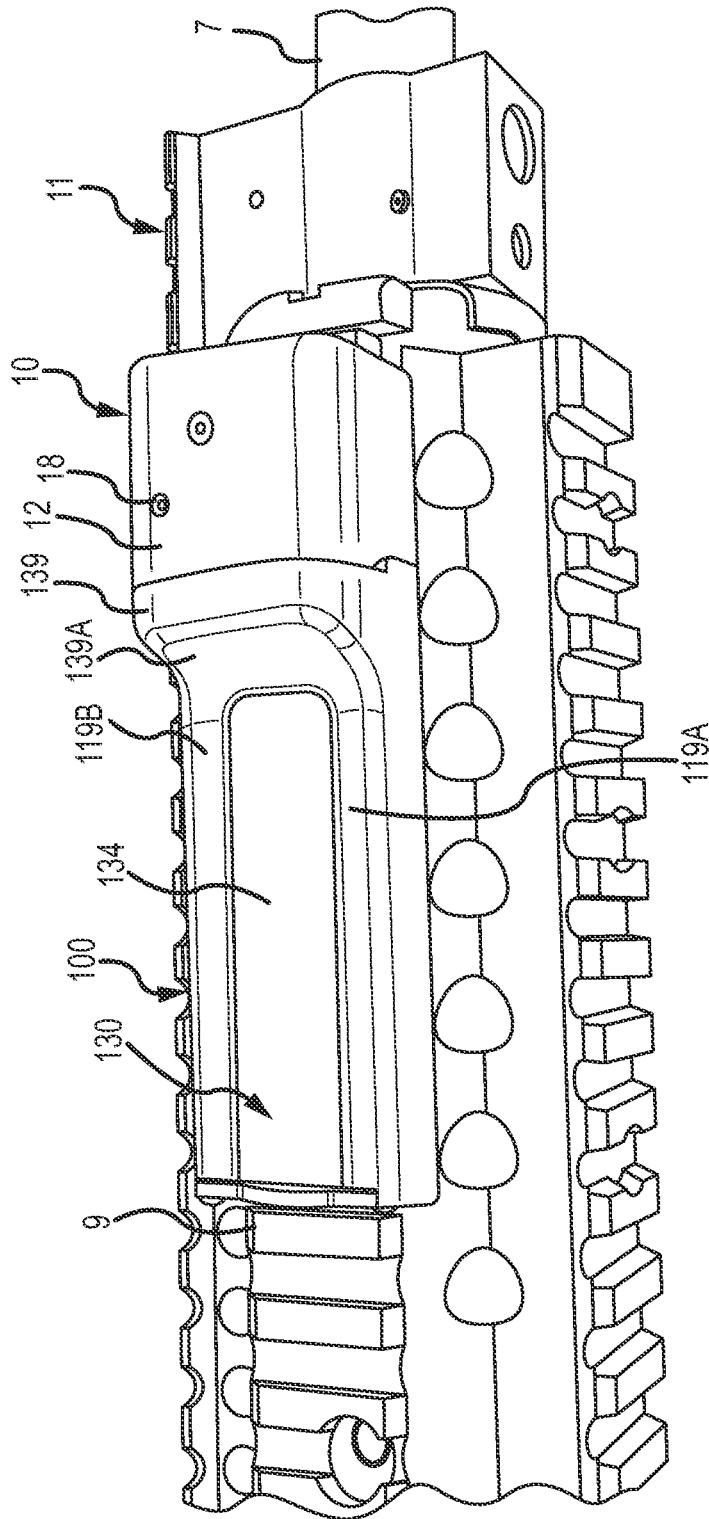


FIG.10

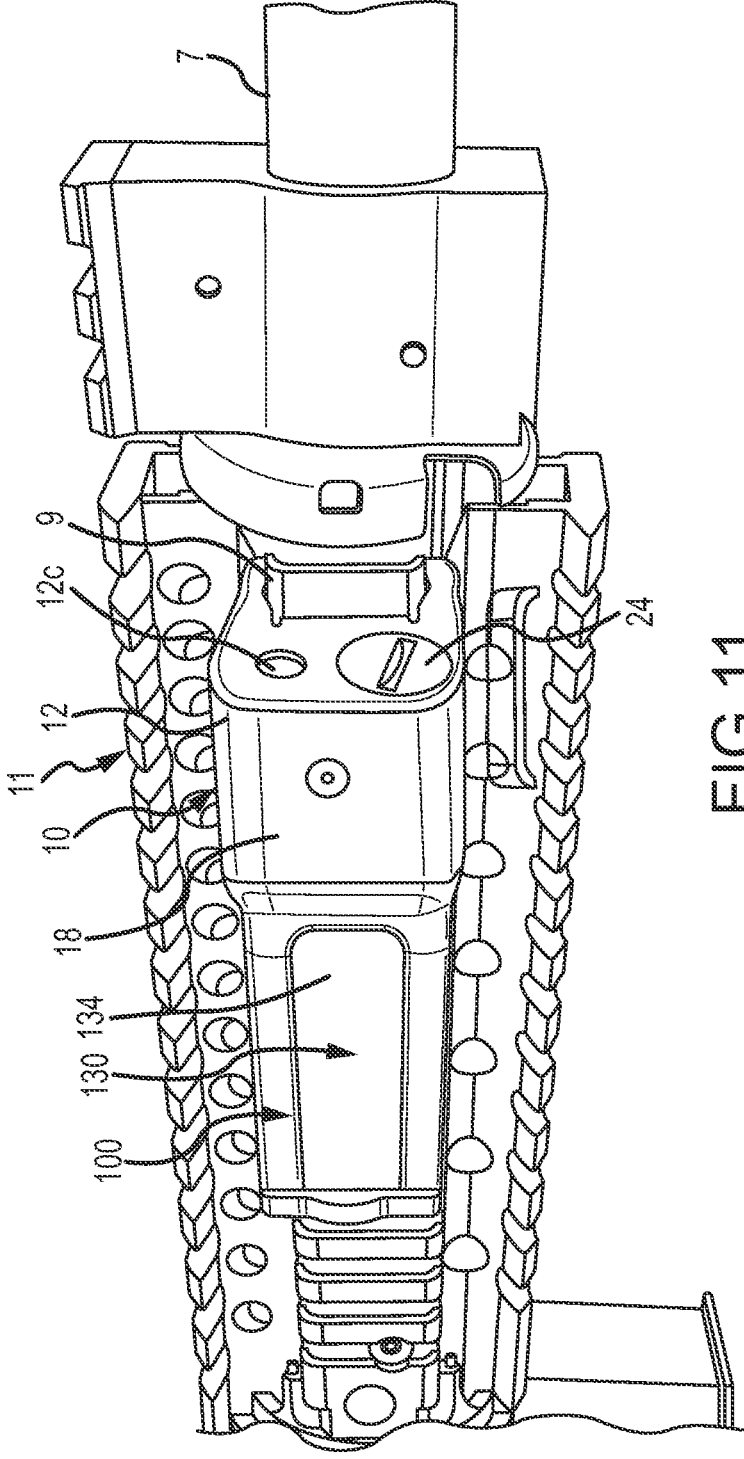


FIG.11

GRIP AIMING DEVICE FOR WEAPONS

FIELD OF THE INVENTION

[0001] The present invention relates to a light-emitting sighting device that can be mounted on a gun and has a switch that can be compressed to activate or deactivate the sighting device while the user is supporting and aiming the gun. The disclosures of U.S. Pat. No. 8,127,485 to Moore et al., U.S. application Ser. No. 12/160,213 to Moore et al., and U.S. Patent Publication No. 2014/030523A to Moore, which are not inconsistent with the disclosure herein, are incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] It is known to utilize a light beam, such as a laser beam, as a sighting aid for guns. If mounted properly on a gun, the laser projects a beam of laser light in a direction generally parallel to the gun's bore. When the light beam and bore are properly aligned, the bullet (or other projectile) will strike, or strike very close to, the location of the light beam projected on a target.

[0003] Such devices are not particularly suitable for ease of use with a rifle, particularly a semi-automatic rifle with an assault design (e.g., an AR-15). The user cannot easily activate the laser while supporting the rifle, and must move one hand to initiate a switch that activates the laser and then return the hand either (depending on which hand is used) to a position to support the rifle, or to the trigger.

SUMMARY OF THE INVENTION

[0004] The invention is a sighting device (sometimes referred to herein as a "device"), and a gun including the sighting device. The sighting device includes a light source and a switch to activate or deactivate the light source without a user having to move a hand (1) from a position in which the gun is being supported, or (2) from the trigger. The sighting device preferably includes a laser as the light source, a power source connectable to the laser, and a mount for mounting the device to a gun. In one embodiment, the sighting device is attached to a picatinny rail on the side of the side of the gun, and includes a compressible touch pad on which the user's fingers naturally rest when supporting the gun. The touch pad preferably includes one or more internal contacts that can each complete a separate circuit for activating the light source. The user can complete the one or more circuits by compressing (or squeezing) the compressible touch pad with sufficient force so at least one of the contacts touches a circuit trace to complete a circuit, which causes power to flow to the light source, while the user is still supporting the gun.

[0005] Each switch could instead be a momentary or other type of switch(es) adjacent the fingers of a user's hand when in the natural position of supporting the gun, rather than a touch pad. Once the light source is activated, one or more light beams are projected. If multiple beams are projected, they preferably define an area between them.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] FIG. 1 shows an exploded view of an embodiment of a sighting device according to the invention.

[0007] FIG. 2 shows a side, perspective view of the housing of the sighting device of FIG. 1.

[0008] FIG. 3 shows a side, perspective view of the grip of the sighting device of FIG. 1.

[0009] FIG. 4 shows a side, perspective view of the sighting device of FIG. 1 with the housing connected to the grip.

[0010] FIG. 5 shows another side, perspective view of the sighting device of FIG. 4.

[0011] FIG. 6 shows a bottom view of the sighting device of FIG. 4.

[0012] FIG. 7 shows a bottom, perspective view of the touch pad of the grip of the sighting device of FIG. 1.

[0013] FIG. 7A shows the inside top surface of the touch pad of FIG. 7.

[0014] FIG. 8 is a front, perspective view of the device of FIG. 4.

[0015] FIG. 9 is a side view of a gun with the device of FIG. 4 mounted thereon.

[0016] FIG. 10 is a side, perspective view of the gun of FIG. 9.

[0017] FIG. 11 is a frontal, side perspective view of the gun of FIG. 9.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0018] Turning now to the drawings where the purpose is to describe a preferred embodiment of the invention and not to limit same, FIGS. 1-8 show a preferred embodiment of a sighting device 10 according to the invention. Device 10 can be any structure that includes a light source and one or more power sources connectable to the light source, and a grip portion with a compressible touch pad with one or more contacts wherein the fingers of the hand with which the user supports the gun are adjacent to or touching the touch pad while that hand is in the natural position of supporting the gun. Alternatively, one or more switches may be on the device and adjacent the user's fingers on the hand supporting the gun.

[0019] Preferably, device 10 is configured to be mounted on a gun 11, and most preferably on a picatinny rail 9 of the gun 11 (shown in FIGS. 9-11). Picatinny rail 9 is known in the art and is used to connect accessories to guns. As shown, picatinny rail 9 is on a side of the gun 11. A device according to the invention is suitable for use on a rifle, semi-automatic rifle (such as an AR-15) fully automatic rifle, shotgun, machine pistol, or other gun in which a user supports the gun with one hand and pulls the trigger with the other.

[0020] Device 10 could also be mounted to or formed on a gun in any other suitable fashion that allows one or more light beams from light source 14 of device 10 to be accurately projected along the longitudinal axis of the gun barrel 7, or along the longitudinal axis of light source 14, and wherein a structure to activate the light source is adjacent to, or touching the fingers of, the user's hand used to support the gun.

[0021] Device 10 includes a housing 12 that retains a light source 14 (which is preferably a laser), and optionally a diffraction lens (not shown). Housing 12 includes a first leg 12A and a second leg 12B, that are used to grip a picatinny rail, such as rail 9 shown in FIGS. 9-11. First leg 12A has a top portion 13A and an opening 13B that receives one side of picatinny rail 9, and second leg 12B has a top portion 15A and an opening 15B that receives the opposite side of picatinny rail 9. A fastener 28 is positioned between first leg 12A and second leg 12B. Fastener 28 is received through

opening 30 in first leg 12B and opening 32 in second leg 12A. A bolt 34 is threaded onto the end of fastener 28 extending past opening 32 and may be tightened to move legs 12A and 12B closer together in order to tighten them against picatinny rail 9. Bolt 34 can be loosened to remove device 10 from picatinny rail 9.

[0022] Housing 12 is preferably made of injection molded plastic, but could be made of any suitable material, such as another metal (for example, MIM carbon steel or extruded aluminum). Housing 12 has a first end 62, a second end 64, and includes a cavity 65 that retains canister 50.

[0023] Second end 64 of housing 12 has a closure 12D with an opening 12C to permit light to be emitted from light source 14, and an opening (not shown) through which cap 24 presses and is threaded into end 56 of canister 54.

[0024] Light source 14 has a first end 14A through which light can be emitted, a second end 14B that is connectable to power source 22 by circuit board 40, and a body 14C. Light source 14 is preferably a visible-light laser module, but could be any light source, including a light emitting diode (“LED”) flashlight (as used herein “flashlight” means any source of visible light other than a laser) or an infra-red light source (such as an infra-red LED or infra-red laser). In the embodiment shown light source 14 is a red-light, 650 nanometer or 635 nanometer, 3.3 mm diode, visible laser, and the laser module has an overall length of about 14 mm and a diameter of about 4.5 mm. Any suitable laser module or other light source may be used, however.

[0025] An opening 16 in housing 12 retains a set screw 18 that can be used to adjust the position of light source 14 in the vertical direction when mounted on picatinny rail 9 as shown in FIGS. 9-11. Another opening (not shown) is on the bottom surface 20 of housing 12 and retains another set screw 18, which can be used to adjust the position of light source 14 side to side when mounted on picatinny rail 9.

[0026] A diffraction lens (not shown), if used, may be formed as part of light source 14 or positioned outside of the lens (positioned at first end 14A) of light source 14 so that a beam of light exiting light source 14 is diffracted into multiple beams to generate a pattern of individual light beams that define an area between them, and one preferred diffraction lens is described in U.S. Pat. No. 8,127,485. The area defined by the individual light beams can be of any suitable shape or size. It is most preferable that the area defined by the multiple light beams is circular, but it could also be triangular, oval, rectangular, hexagonal, octagonal or of any suitable shape. Alternatively, multiple beams (if utilized) can be created in other ways. A light source according to the invention may also generate a single light beam and not include a diffraction lens, or may have a lens to diffract the light into a cross or any other suitable shape or pattern.

[0027] In one preferred embodiment there are at least three light beams defining an area between them, and most preferably eight beams of light defining an area between them, even though any number of light beams of three or more can be utilized. The light source may also create one or more other light beams inside the area, and in one embodiment creates a single light beam in the center of the area formed by the multiple beams.

[0028] If used, the diffraction lens, or other method of generating multiple light beams, may direct the one or more

light beams straight along the axis of gun barrel 7, or drop vertically over distance to match the vertical drop of a bullet fired from the gun.

[0029] Device 10 as shown further includes: (1) an integrated circuit board 40, (2) a canister 50 having a first cavity 52, a second cavity 54, a first end 56, a second end 58, and a dividing wall 60 that separates cavities 52 and 54, (3) an insulating sleeve 21, and (4) a cushion sleeve 61.

[0030] The purpose of canister 50 is to retain light source 14 and power source 22. Any suitable structure or structures may be used for this purpose. Canister 50 is preferably made of aluminum or other conductive material so as to complete the connectivity required for the proper functioning of the circuit board 40, when circuit board 40 is positioned against end 58 of canister 50 when device 10 is fully assembled.

[0031] First cavity 52 retains cushion sleeve 61 and light source 14, wherein cushion sleeve 61 fits over body 14C. Cushion sleeve 61 helps to maintain light source 14 in proper alignment when gun 11 is fired or otherwise jarred or bumped.

[0032] Power source 22 is retained within insulating sleeve 21 inside of second cavity 54. Power source 22 is preferably three silver oxide 1.5V coin batteries connectable to light source 14 via circuit board 40. Removable cap 24 is threadingly received in and covers end 56 of second cavity 54. A depression 24A is formed in cap 24 in order to receive spring 26. Cap 24 can be removed to access and replace power source 22. A screw 72 is received in an opening in the bottom of housing 12 and is threadingly received in an opening (not shown) in the bottom of canister 50 to assist in retaining canister 50 in cavity 65 of housing 12.

[0033] Integrated circuit board 40 is configured to be received and mounted on second end 58 of canister 50. Board 40 is preferably plastic and includes circuitry (not shown). The function of circuit board 40 is to electrically connect the power source 22 to the light source 14 and any suitable structure or device can be used for this purpose. Circuit board 40 is designed for negative switching wherein power is generated from the negative side of power source 22 and to the light source 14. In the preferred embodiment of device 10, the integrated circuit on circuit board 40 allows for continuous or intermittent delivery of power to light source 14. Board 40 includes an integrated circuit (not shown) and two through holes 74 through which screws 76, pass and are retained in openings 60 in canister 50.

[0034] In this embodiment, a spring (not shown) is connected to the back of light source 14 in any suitable manner, and is then connected to board 40, preferably by soldering. The spring acts as the negative contact for light source 14 to board 40 and also allows light source 14 to move freely back and forth axially and in all directions. In this manner, light source 14 can freely be adjusted by set screws 18.

[0035] Device 10 also includes a grip 100 that attaches to housing 12 by screws 76 passing through openings 122 in circuit board support member 123. Grip 100 includes a first leg 112A and a second leg 112B, that slide onto a picatinny rail, such as rail 9 shown in FIGS. 9-11. First leg 112A has a top portion 113A and an opening 113B that receives one side of picatinny rail 9, and second leg 112B has a top portion 115A and an opening 115B that receives the opposite side of picatinny rail 9.

[0036] Grip 100 also has a first end 102, a second end 104, a bottom slot 120 for receiving touch pad 130, and openings 122. When assembled, touch pad 130 is received in slot 120,

rear cover **140** is positioned against end **104** of grip **100** and screws **150** are received through openings **142** in rear cover **140**, and threadingly received in openings **122**. In this manner rear cover **140** secures and protects the inner cavity of touch pad **130**.

[0037] Grip **100** further includes an extension **139** that has a stop **139A**, which a user can use to properly position his/her hand on device **10**, and a cavity **123** with an outer lip **123A**. When device **10** is assembled, lip **123A** is retained in end **62** of housing **12** against abutment **62A**.

[0038] Touch pad **130** has an extension **132** that contacts the bottom of circuit board **40** and is preferably soldered thereto to make an electrical connection between the circuitry in touch pad **130** and the circuitry on circuit board **40**. As best seen in FIGS. **7** and **7A**, touch pad **130** has a curved, flexible outer side **134** (which is preferably a flexible plastic) and a flat inner side **136**. In this embodiment, two electrical contacts **134A** and **134B** are attached to the inner surface of outer side **134**, as best seen in FIG. **7**. The inner surface of inner side **136** has two circuit traces **136A** and **136B**. When flexible, compressible outer side **134** is sufficiently compressed by a user, contact **134A** touches circuit trace **136A** to complete a circuit and/or contact **134B** touches circuit trace **136B** to complete a circuit. When either or both circuits are completed, power flows from power source **22** through circuit board **40** to light source **14**, turning the light source **14** on such that it emits light. Power may be connected to light source **14** either as long as the outer side **134** is sufficiently compressed to complete at least one circuit, or light source **14** can turn on when outer side **134** is sufficiently compressed to complete at least one circuit twice quickly (preferably 3 seconds or less, 2.5 seconds or less, 2 seconds or less, or 1.5 seconds or less), and light source **14** then stays on until outer side **134** is sufficiently compressed a subsequent time in order to disconnect power from light source **14**.

[0039] Having thus described some embodiments of the invention, other variations and embodiments that do not depart from the spirit of the invention will become apparent to those skilled in the art. The scope of the present invention is thus not limited to any particular embodiment, but is instead set forth in the appended claims and the legal equivalents thereof. Unless expressly stated in the written description or claims, the steps of any method recited in the claims may be performed in any order capable of yielding the desired result.

What is claimed is:

1. A sighting device for mounting on a gun, the gun having a barrel with a longitudinal axis, a bore, and a trigger; the sighting device including a light source and a power source connectable to the light source, the light source having a first mode in which it emits light and a second mode in which it does not emit light, the sighting device further including a grip affixed to the gun and positioned on the side of the gun, the sighting device including one or more circuits wherein each circuit when completed switches the light source from the second mode to the first mode.

2. The sighting device of claim **1** wherein the grip has a compressible touch pad wherein a user completes the one or more circuits by sufficiently compressing the compressible touch pad.

3. The sighting device of claim **2** wherein the compressible touch pad is between 1" and 6" in length.

4. The sighting device of claim **2** wherein the compression touch pad comprises an outer surface that is convex, flexible and plastic.

5. The sighting device of claim **2** wherein the light source is activated when sufficient pressure is applied to the compressible touch pad and is deactivated when the pressure is removed.

6. The sighting device of claim **2** wherein the light source is activated when sufficient pressure is applied to the compressible touch pad twice to turn the light source on, and deactivated when sufficient pressure is again applied to the compressible touch pad to turn the light source off.

7. The sighting device of claim **2** wherein the compressible touch pad has an outer side having an interior surface with at least one electrical contact, and a bottom, inner surface with at least one circuit trace wherein the at least one contact touches the at least one circuit trace to complete a circuit when the compressible touch pad is sufficiently compressed.

8. The sighting device of claim **1** wherein the light source further includes a housing with a plurality of apertures and a set screw threadingly received in each aperture, each of the set screws for adjusting the position of the light source.

9. The sighting device of claim **1** wherein there is a flexible sleeve surrounding the light source.

10. The sighting device of claim **1** wherein the power source is one or more batteries.

11. The sighting device of claim **1** wherein the power source is spaced apart from the light source.

12. The sighting device of claim **1** wherein the sighting device includes a mount for attaching to a picatinny rail of a gun.

13. The sighting device of claim **12** wherein the mount includes a first leg configured to fit onto a first side of the picatinny rail and a second leg opposite the first leg, the second leg configured to fit onto a second side of the picatinny rail.

14. The sighting device of claim **13** that further includes a fastener to draw the first leg and second leg closer together in order to tighten the mount onto the picatinny rail.

15. The sighting device of claim **14** wherein the fastener extends from the first leg to the second leg, the fastener being tightened to move the first leg and second leg closer together, and being loosened so the first leg and second leg move farther apart.

16. The sighting device of claim **1** that has two circuits wherein each circuit can independently activate the light source.

17. The sighting device of claim **7** wherein the interior surface of the outer side has two electrical contacts, and the bottom, inner surface has two circuit traces.

18. The sighting device of claim **1** wherein the sighting device includes a first canister and a second canister, wherein the first canister includes the light source, and the second canister includes the power source.

19. The sighting device of claim **1** wherein the light source pulses when it emits light.

20. The sighting device of claim **1** wherein a single beam of light from the light source passes through a diffraction lens which splits the single beam into three or more beams of light defining an area in the center of the three or more beams of light.

21. The sighting device of claim **20** wherein the diffraction lens splits the single beam into three or more beams of

light defining an area in the center of the three or more beams of light, and a separate beam of light in the center of the area.

22. The sighting device of claim **1** wherein the light source emits light when activated and the light moves downward vertically as it moves farther from the light source.

23. The sighting device of claim **1** wherein the light source is selected from one of the group consisting of: a visible laser module; and an infra-red laser module.

24. A gun including:

a muzzle,

a bore,

a trigger, and

a sighting device attached to the gun, the sighting device including a light source and a power source connectable to the light source, the light source having a first mode in which it emits light and a second mode in which it does not emit light, the sighting device further including a grip on the side of the gun, the light source including one or more switches for switching the light source from the second mode to the first mode.

25. The gun of claim **24** that is a rifle, semiautomatic rifle, or a machine pistol.

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