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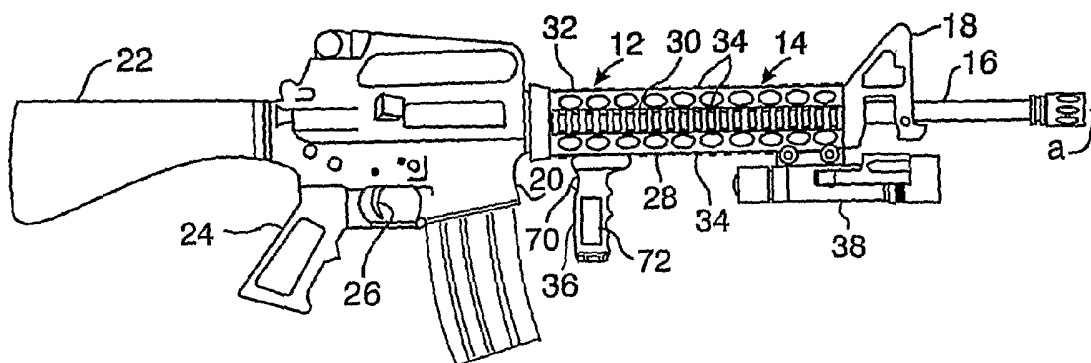
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(54) Title: REMOTE SWITCHING SYSTEMS



(57) Abstract: Apparatus and method for permitting a gun user to wirelessly control switching of a remotely disposed electrical appliance. The system utilizes a switchable radio-frequency transmitter device preferably configured as a handgrip adapted to be mounted to the gun, for controlling ON/OFF switching of a light beam generator which may also be adapted to be mounted to the gun.

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REMOTE SWITCHING SYSTEMS

BACKGROUND OF THE INVENTION

This invention relates to remote switching systems for electrical appliances, and more particularly to wireless switching devices on firearms and other guns for remotely actuating an electrical appliance including a light beam generator mounted to the gun.

Switchable electrical appliances including light beam generators, such as flashlights and laser aiming devices, have been adapted for being secured to firearms as target illuminators, navigation illuminators and laser sights. Such light beam generators are mounted to the firearm such that the generated light beam is parallel and preferably close to the longitudinal axis of the firearm's barrel. Electrical appliances or accessories for firearms including light beam generators are conventionally equipped with at least one switch structurally and electrically integrated with the appliance, so that placement of the light beam generator on a particular gun is often determined as a compromise between optimum illumination in a particular situation and optimum user access to the ON/OFF switches for turning the light beam generator ON and OFF.

Firearm accessories including light beam generators are further conventionally equipped with a mounting device for releasably securing the accessory to a rail mount structure secured to the firearm. Such accessory mounts and rail structures may include rail interface systems well known in the art pertaining to guns, and in particular with respect to submachine guns, carbines, rifles, shotguns and other firearms including handguns used for military and law enforcement operations, as well as other types of guns such as gas, air, electric and spring operated guns.

In certain mounting configurations, it may be desired to mount the light beam generator to the gun at various positions about the longitudinal axis of the firearm barrel, and/or at various positions along the barrel. Some versatility in placement has in the past been implemented by providing the mounted light beam generator with the capability of adjustably offsetting orientation of the light source assembly with respect to the body of the light beam generator containing the battery and ON/OFF switch, as disclosed in U.S. Patent 6,675,521 issued to Paul Y. Kim, incorporated herein by reference, or by providing the light beam generator with a pressure-actuated momentary tape switch connected to the light beam generator body through a length of flexible conductive wire cable.

SUMMARY OF THE INVENTION

The present invention provides a method and apparatus for permitting a user of a gun to remotely control switching of an electrical appliance without requiring a structural or wire connection between the remote switching control device and the electrical appliance. In a preferred embodiment, the remote switching control device is mounted to the gun at a position for permitting the user convenient and comfortable access to the switches for wirelessly turning the electrical appliance ON and OFF. The remote switching device is preferably configured as a handgrip adapted to be mounted to the gun, and the electrical appliance preferably comprises a light beam generator adapted to be mounted to the gun.

According to one aspect of the present invention, there is provided remote switching apparatus comprising: a transmitter device adapted to be mounted to a gun, the transmitter device including a switch and a radio-frequency transmitter coupled to the switch for transmitting a radio-frequency signal in response to actuation of the switch; and an electrical appliance having an ON condition and an OFF condition, the electrical appliance including a radio-frequency receiver for receiving the radio-frequency signal, the electrical appliance being responsive to the radio-frequency receiver receiving the radio-frequency signal for being placed in its ON condition.

The electrical appliance may be also adapted to be mounted to the gun, and a preferred embodiment of the electrical appliance comprises a light beam generator. The gun may include a rail structure secured thereto, and the preferred transmitter device embodiment includes a mounting assembly removably securable to the rail structure for mounting the transmitter device to the gun. The light beam generator may also include a mounting assembly securable to the rail structure for mounting the light beam generator to the gun.

The transmitter device preferably includes a housing configured as a handgrip and including a mounting assembly removably securable to the rail structure. In the preferred embodiment, a battery is disposed in the housing in circuit with the switch and the radio-frequency transmitter; and a controller is preferably carried by the housing in circuit with the battery, the switch and the radio-frequency transmitter, for controlling

the transmitter to transmit the radio-frequency signal in response to actuation of the switch by a user.

The light beam generator, in its preferred embodiment, includes a battery and a controller in circuit with the radio-frequency receiver, for controlling placing the light
5 beam generator in its ON condition when the radio-frequency signal is received by the radio-frequency receiver. The light beam generator may also include a remote ON/OFF switch in circuit with the controller, the remote ON/OFF switch actuable by a user for enabling and alternatively disabling operation of the radio-frequency receiver. The light
10 beam generator may further include a power ON/OFF switch in circuit with the battery and the controller, the power ON/OFF switch being manually actuable by a user for controlling ON/OFF operation of the light beam generator when operation of the radio-frequency receiver is disabled.

According to another aspect of the present invention, there is provided a method for remotely actuating an electrical appliance, such as a light beam generator, the
15 method comprising: providing a gun having a transmitter device thereon; providing the electrical appliance; actuating the transmitter device to transmit a radio-frequency signal; detecting the radio-frequency signal at the electrical appliance; and actuating the electrical appliance in response to the radio-frequency signal received at the electrical
20 appliance. In a preferred manner of practicing the method, the gun providing step includes providing the transmitter device and removably mounting the transmitter device to the gun. In the electrical appliance providing step, the electrical appliance may comprise a light beam generator removably secured to the gun.

BRIEF DESCRIPTION OF THE DRAWINGS

The novel features believed to be characteristic of the present invention, together
25 with further advantages thereof, will be better understood from the following description considered in connection with the accompanying drawings in which preferred embodiments of the invention are illustrated by way of example. It is to be expressly understood, however, that the drawings are for the purpose of illustration and description only and are not intended as a definition of the limits of the invention.

FIG. 1 is side elevation view of a firearm having mounted thereto a preferred embodiment of remote switching apparatus according to the present invention;

FIG. 2 is a perspective view of a preferred embodiment of a radio-frequency transmitter device according to the present invention, shown in FIG. 1 in decreased
5 scale;

FIG. 3 is a perspective view of a preferred embodiment of a radio-frequency controlled appliance according to the present invention, specifically a light beam generator accessory device for a firearm, shown in FIG. 1 in decreased scale;

FIG. 4 is a rear elevation view of the device of FIG. 2;

10 FIG. 5 is a generally cross-sectional view of the device of FIG. 4, taken along the line 5-5 of FIG. 4 and viewed in the direction of the appended arrows;

FIG. 6 is a front elevation view of the light beam generator device of FIG. 3;

FIG. 7 is a generally cross-sectional view of the light beam generator device of FIGS. 3 and 6, taken along the line 7-7 of FIG. 6 and viewed in the direction of the
15 appended arrows;

FIG. 8 is a schematic representation of an example of an electrical circuit carried by the transmitter device of FIGS. 2, 4 and 5; and

FIG. 9 is a schematic representative of an example of an electrical circuit carried by the light beam generator device of FIGS. 3, 6 and 7.

20 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Turning first to FIG. 1, there is illustrated an example of a gun, specifically a firearm such as an M16 automatic rifle, equipped with an accessory mount 14 secured to the firearm 12 and surrounding a section of the firearm's barrel 16 along the firearm's fore-end section between the front sight 18 and receiver 20. The firearm 12
25 further includes a stock 22, pistol grip 24 and trigger 26.

Reference to a "gun" herein includes all types of guns, including firearms and other guns such as gas, air, electric and spring operated guns.

Accessory mounts are well-known in the firearms art, including rail interface devices such as disclosed in U.S. Patents 5,826,363 of Douglas D. Olson, 5,590,484 of
30 Aurelius A. Mooney et al., 6,508,027 of Paul Y. Kim, and 6,508,027 of Paul Y. Kim

and John W. Matthews, each of which patents are incorporated herein by reference. Accessory mounts such as mount 14 typically include at least one longitudinal rail structure, extending parallel to the longitudinal axis a of the firearm barrel 16, such as a bottom rail structure 28 along the exterior underside thereof, and may also include side
5 rail structures 30 (only one of which is shown in FIG. 1) and a top rail structure 32, to which may be mounted one or more firearm accessories such as a laser sight, a target illuminator, a navigation illuminator, a handgrip, a combined handgrip and illuminator device such as disclosed in U.S. Patent 6,622,416 of Paul Y. Kim incorporated herein by reference, and other devices.

10 One type of prior art rail structure commonly used in firearm accessory mounts (and sometimes used in accessory mounts for other guns) comprises a series of longitudinally spaced apart ribs 34, such as specified in MIL-STD-1913 and commonly known as a Picatinny rail. The rail structures 28, 30 and 32 may comprise Picatinny rails, or one or more of the rail structures may comprise modified Picatinny rail
15 structures as described in the aforementioned U.S. Patents 6,508,027 and 6,779,288, each of which patents have been incorporated herein by reference.

The remote switching system of the present invention includes a switchable radio-frequency transmitter device 36 carried by or adapted to be mounted to the firearm 12, and an electrical appliance 38 having operative states remotely controlled by
20 radio-frequency signals transmitted by the radio-frequency transmitter device 36.

As shown in FIGs. 1, 2, 4, 5 and 8, a preferred embodiment of the radio-frequency transmitter device includes a housing 40 containing a battery 42 comprising at least one battery cell, for example a 3-volt lithium battery. The battery 42 is contained within an electrically conductive sleeve 44 conductively engaging a battery
25 retainer cap 46 threadedly secured to the lower end of the housing 40 and including a first contact spring 48 in electrical contact with one of the battery's terminals. The battery's other terminal is in electrical contact with a second spring contact 50 retained by an electrically insulating plug 52 having an aperture through which a conductive wire 54 extends and is attached to the second spring 50. The two battery contacts 48, 50

(comprising the conductive sleeve 44 via conductive screw 56, and the wire 54) are coupled in circuit to printed circuit board 58.

The housing 40 is preferably configured in the form of a handle or handgrip. The handgrip 40 is mounted to a rail of the accessory mount 14 by a mounting assembly 5 60 which may include a mounting plate 62 secured to the housing 40 and including projections 64 cooperating with one of the rails 28, 30, 32 for removably mounting the handgrip 40 thereto. Such mounting assemblies 60 are well known in the firearms accessories art. Clamping of the projections 64 to a rail structure may be implemented by laterally moving opposing projections 64 toward each other by thumb screws 66 10 extending along the channels between adjacent ribs 34 of the rail, as is well known in the art. Other examples of devices for implementing clamping securement to a rail structure include a single platform mount of the type described in the aforementioned U.S. Patent 6,622,416, and the mounting plate structure described in U.S. Patent 6,622,416, which patents have been incorporated herein by reference.

15 The handgrip 40 is provided with a constant ON/OFF switch 68, actuable by an actuator 70 such as a toggle or preferably a pushbutton actuator 70, situated near the top of the handgrip 40 and rearwardly disposed for thumb actuation when the user grips the handgrip 40. The handgrip 40 preferably also includes at least one momentary switch for providing the user with instantaneous light control. Momentary switches are well 20 known in the art and include the so-called tape switches used in firearms systems. Their construction typically includes spaced-apart electrodes in a flexible enclosure that are squeezed together by the user and thus brought into electrical contact with each other when it is desired to place the switch in an ON condition, through conventional electrical circuitry including the normally spaced-apart electrodes. The momentary tape 25 switches 72 are situated on opposite sides of the handgrip 40, as shown in FIGs. 1, 2 and 4. One or the other of these tape switches 72 (depending upon which one of the user's hands is employed for grasping the handgrip 40) is squeezed by the user's fingers when the user desires to place the switch in its ON condition, which remains in such ON condition for only as long as one of the tape switches 72 remains squeezed.

Alternatively, or additionally, the constant ON/OFF switch 68 may further include a momentary switching function.

The handgrip 40 is preferably mounted to one of the rail structures 28, 30, 32 (for example, to the bottom rail structure 28 as shown in FIG. 1) of the rail interface accessory mount 14, within comfortable reach of a user's hand, in a position such that the user of the firearm 12 may comfortably grasp the handgrip 40 with one hand while the user's other hand grasps the pistol grip 24, for permitting firing of the firearm 12 while simultaneously permitting the user to actuate the switches 68 and/or 72.

As shown in FIG. 8, the housing 40 is provided with a radio-frequency transmitter 74 coupled to a controller 76 in circuit with the constant ON/OFF switch 68, the momentary switches 72, and the battery 42, for transmitting a radio-frequency signal via antenna 78 in response to actuation of any one of the switches 68, 72. The controller 76 is preferably microprocessor-based, one example of which is microcontroller model PIC18F4320 manufactured and marketed by Microchip Technology Inc. (of Chandler, Arizona), with frequency hopping control. An example of a radio-frequency transmitter 74 includes a frequency synthesizer and power amplifier as in the transmitter section of a transceiver manufactured and marketed by Micrel, Inc. (of San Jose, California) under the model number MICRF505. The radio-frequency transmitter 74 (i.e., a transceiver including the transmitter 74 if a transceiver is utilized) and the microprocessor-based controller 76 included in the circuit of FIG. 8 are carried by the housing 40, preferably on printed circuit board 58 (FIG. 5) supported in the housing 40. The antenna 78 is preferably disposed within the housing 40 and may be integral with the transmitter 74, or the antenna 78 may be carried externally of the housing 40.

FIGs. 1, 3, 6, 7 and 9 show an example of a preferred embodiment of a radio-frequency controlled electrical appliance 38 included in the remote switching system of the present invention, specifically a light beam generator. In its preferred configuration, the light beam generator 38 is provided with a mounting assembly 60' which may be similar in structure and operation to the mounting assemblies 60 of the handgrip 40 described above, for mounting the light beam generator 38 to one of the rails 28, 30, 32

of the accessory mount 14. Other mounting assemblies may be utilized for mounting the handgrip 40 and/or the light beam generator 38 to the firearm 12 without utilizing a rail mount 14, for example the handgrip 40 and/or the light beam generator 38 may be directly secured to the firearm's barrel 16 or other part of the firearm 12 without a rail interface.

One example of the light beam generator 38 comprises a housing including a rear housing portion 80 containing a battery 82 (including at least one battery cell, such as two or three 3-volt lithium cells), and a forward housing portion 83 including a light emitter assembly 84. The light emitter assembly includes a high intensity light source assembly 86 for illuminating a target. The high intensity light source assembly 86 includes a high intensity light emitter or lamp 88, such as an incandescent light bulb or a high intensity light emitting diode (such as a high luminous flux LED manufactured by Lumilux Lighting, LLC, of San Jose, California and marketed under the trademark LUXEON), with the emitted light forwardly directed by such means as a parabolic reflector 90 or a totally internal reflective lens.

The light emitter assembly 84 may further include at least one low intensity light source assembly for use as a navigation illuminator. In the preferred embodiment, the light emitter assembly 84 includes a first low intensity light source assembly 92 including an LED 94 emitting light in the visible light frequency range, as well as a second low intensity light source assembly 96 including an LED 98 for emitting light in the infrared frequency range.

The light emitter assembly 84 may further include at least one laser sight assembly. For example, the preferred light emitter assembly 84 may include a first laser sight module 100 operating in the visible light frequency range and a second laser sight module 102 operating in the infrared frequency range. Laser sight modules are well known in the firearms art.

A user may select the particular light source assembly 86, 92, 96, 100 or 102 to be implemented by manually controlling a multi-position selector switch 104 such as a multi-position switch having a rotatable actuator or knob 105.

As shown in FIG. 9, the light beam generator 38 is provided with a radio-frequency receiver 106 coupled to a controller 108 in circuit with the battery 82 through regulator 110 and a power ON/OFF switch 112 at the tail end of the rear housing 80 (FIG. 7). The controller 108 is preferably microprocessor-based; the use of such microcontrollers in light beam generator assemblies is discussed in U.S. Patent 6,841,941 of Paul Y. Kim and William A. Hunt, which patent is incorporated herein by reference.

An example of such microcontroller may be the same as or similar to the microcontroller 76 identified above, preferably with frequency hopping capability. Similarly, an example of a radio-frequency receiver 106 may comprise the transmitter section of the transceiver identified above of which the transmitter section 74 is utilized in the handgrip 40. The radio-frequency receiver 106 (i.e., a transceiver including the transmitter 106 if a transceiver is utilized), the microcontroller 108 and the regulator 110 included in the circuit of FIG. 9 are carried by the light beam generator housing, such as on printed circuit board 114 (FIG. 7). The antenna 116 is preferably disposed within the housing and may be integral with the receiver 106, or the antenna 116 may be carried externally of the housing.

The lamp selector switch 104 is manually actuatable by the user for selecting the light source assembly 86, 92, 96, 100, 102 to be activated when the radio-frequency signal is transmitted by the handgrip transmitter 76 and received by the light beam generator receiver 106. For example, the selector switch 104 in FIG. 9 is shown in a first contact position corresponding to selection of the high intensity light source assembly 86, so that when the radio-frequency signal is received by the receiver 106 the microcontroller 108 detects such signal reception and switch position selection and causes the emitter of the high intensity light source assembly 86 to be energized by the battery 82. Such energization is implemented by the controller 108 causing closure of switch 118a as may be implemented by a power MOSFET also preferably on printed circuit board 114. Similarly, the user may select a different position of the switch 104 corresponding to one of the other emitter switches or power MOSFETs 118b, c, d or e, for turning on the corresponding light source assembly 92, 96, 100 or 102 when the

transmitted radio-frequency signal is received by the receiver 106. Energization of the selected light emitter will continue for as long as the radio-frequency signal is being received; the controller 108 will turn off the selected light emitter when the radio-frequency signal is no longer received by the receiver 106.

5 The light beam generator 38 is provided with a remote ON/OFF switch 120 (implemented by toggle switch 120 shown in FIG. 7) coupled to the microprocessor 108, for enabling and alternatively disabling remote operation of the light beam generator 38, for example by enabling and alternatively disabling operation of the radio-frequency receiver 106. The user may manipulate the remote ON/OFF switch 120 to its
10 OFF position, the switch 120 operating as a manual override of remote operation by the microprocessor 108 and permitting the power ON/OFF tail cap switch 112 to be manipulated by the user for activating the light source assemblies (as selected by the selector switch 104) through the microprocessor 108, upon manual ON and OFF actuation of the tail cap switch 112.

15 In a preferred manner of using the preferred embodiment of the remote switching apparatus of the present invention, the user secures the radio-frequency transmitter handgrip 40 to the firearm 12, for example by utilizing the handgrip's mounting assembly 60 to secure or mount the handgrip 40 to one of the rail structures of the accessory mount 14 such as the bottom rail structure 28 as shown in FIG. 1, at a
20 convenient location for allowing the user to comfortably grasp the handgrip 40 with one of the tape switches 72 accessible to the user's fingers and with the constant ON/OFF switch 68 accessible to the user's thumb. The user also secures the radio-frequency receiver light beam generator 38 to the firearm 12, for example by using the light beam generator's mounting assembly 60' to one of the accessory mount rail structures such as
25 the bottom rail structure 28 as shown in FIG. 1 or to one of the side rail structures 30.

 When remote or wireless switching capability is desired, the user assures that the remote ON/OFF switch 120 is in its ON condition and that the power ON/OFF switch 110 is in its ON condition. The user selects which one of the light source assemblies 86, 92, 96, 98 or 100 is to be actuated by manipulating the multi-position
30 selection switch 104.

The user may cause the selected light source assembly 86, 92, 96, 100 or 102 of the light beam generator 38 to turn ON its respective light emitter either by placing the constant ON/OFF switch 68 of the handgrip 40 in its ON position (such as by depressing the pushbutton actuator 70 from the switch OFF position to the switch ON position) or by squeezing one of the momentary tape switches 72.

The user may inactivate or defeat the remote function of the light beam generator 38 by placing the remote ON/OFF switch in its OFF position, thereby causing the microcontroller 108 to effectively remove the radio-frequency receiver 106 from the circuit of FIG. 9. In such case, the power ON/OFF switch 112 may be manually activated by the user for causing the microcontroller 108 to turn ON or OFF the light emitter of the light source assembly 86, 92, 96, 100 or 102 selected by means of the selector switch 104.

Thus, there has been described a preferred embodiment of an apparatus and method for permitting a gun user to wirelessly control switching of a remotely disposed electrical appliance. The system utilizes a switchable radio-frequency transmitter device preferably configured as a handgrip adapted to be mounted to the gun, for controlling ON/OFF switching of a light beam generator which may also be adapted to be mounted to the gun. Other embodiments of the present invention, and variations of the embodiments described herein, may be developed without departing from the essential characteristics thereof. Accordingly, the invention should be limited only by the scope of the claims listed below.

CLAIMS:

1. Remote switching apparatus comprising:

a transmitter device adapted to be mounted to a gun, said transmitter device including a switch and a radio-frequency transmitter coupled to said switch for transmitting a radio-frequency signal in response to actuation of said switch; and

an electrical appliance having an ON condition and an OFF condition, said electrical appliance including a radio-frequency receiver for receiving said radio-frequency signal, said electrical appliance responsive to said radio-frequency receiver receiving said radio-frequency signal for being placed in said ON condition.

2. The apparatus according to Claim 1, including a rail structure secured to the gun, wherein:

said transmitter device includes a mounting assembly securable to the rail structure for mounting said transmitter device to the gun.

3. The apparatus according to Claim 1, wherein:

said electrical appliance is adapted to be mounted to the gun.

4. The apparatus according to Claim 3, including a rail structure secured to the gun, wherein:

said electrical appliance includes a mounting assembly securable to the rail structure for mounting said electrical appliance to the gun.

5. The apparatus according to Claim 4, wherein:

said transmitter device includes a mounting assembly securable to the rail structure for mounting said transmitter device to the gun.

6. The apparatus according to Claim 1, wherein:

said switch of said transmitter device is a momentary switch.

7. The apparatus according to Claim 1, wherein:

said switch of said transmitter device is a constant ON/OFF switch.

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8. The apparatus according to Claim 7, wherein:

said transmitter device includes a momentary switch, and said radio-frequency transmitter is coupled to said momentary switch for transmitting said radio-frequency signal in response to actuation of said momentary switch.

9. The apparatus according to Claim 8, wherein:

10

said momentary switch and said constant ON/OFF switch are actuatable independently of one another.

10. The apparatus according to Claim 1, wherein:

said transmitter device includes a handgrip.

11. The apparatus according to Claim 10, wherein:

15

said transmitter device is configured with said switch positioned for permitting a user to actuate said switch when gripping said handgrip.

12. The apparatus according to Claim 1, wherein:

said transmitter device includes a housing adapted to be mounted to the gun; and

20

said switch of said transmitter device and said radio-frequency transmitter are carried by said housing.

13. The apparatus according to Claim 12, wherein:

said housing is configured as a handgrip.

14. The apparatus according to Claim 12, including:

a battery disposed in said housing in circuit with said switch and said radio-frequency transmitter.

15. The apparatus according to Claim 14, including:

a controller disposed in said housing in circuit with said battery, said switch and said radio-frequency transmitter, for controlling said transmitter to transmit said radio-frequency signal in response to actuation of said switch.

16. The apparatus according to Claim 1, wherein:

said electrical appliance includes a housing and a battery disposed in said housing in circuit with said radio-frequency receiver.

17. The apparatus according to Claim 16, wherein:

said housing is adapted to be mounted to the gun.

18. The apparatus according to Claim 16, wherein:

said electrical appliance includes a controller disposed in said housing in circuit with said battery and said radio-frequency receiver, for controlling the placing of said electrical appliance in said ON condition when said radio-frequency signal is received by said radio-frequency receiver.

19. The apparatus according to Claim 18, wherein:

said housing is adapted to be mounted to the gun.

20. The apparatus according to Claim 18, wherein:

said electrical appliance includes a remote ON/OFF switch in circuit with said controller, said remote ON/OFF switch actuatable by a user for enabling and alternatively disabling remote operation of said electrical appliance.

21. The apparatus according to Claim 20, wherein:

said electrical appliance includes a power ON/OFF switch in circuit with said battery and said controller, said power ON/OFF switch actuatable by a user for controlling ON/OFF operation of said electrical appliance when remote
5 operation of said electrical appliance is disabled.

22. The apparatus according to Claim 18, wherein:

said electrical appliance includes a remote ON/OFF switch in circuit with said controller, said remote ON/OFF switch actuatable by a user for enabling and alternatively disabling operation of said radio-frequency receiver.

10 23. The apparatus according to Claim 22, wherein:

said electrical appliance includes a power ON/OFF switch in circuit with said battery and said controller, said power ON/OFF switch actuatable by a user for controlling ON/OFF operation of said electrical appliance when operation of said radio-frequency receiver is disabled.

15 24. The apparatus according to Claim 1, wherein:

said electrical appliance comprises a light beam generator.

25. The apparatus according to Claim 24, wherein:

said light beam generator is adapted to be mounted to the gun.

26. The apparatus according to Claim 24, wherein:

20 said light beam generator includes a plurality of light source assemblies and a multi-position switch, said multi-position switch actuatable by a user for selecting one of said light source assemblies to be activated when said radio-frequency signal is received by said radio-frequency receiver.

27. The apparatus according to Claim 24, wherein:

said light beam generator includes a housing and a battery disposed in said housing in circuit with said radio-frequency receiver.

28. The apparatus according to Claim 27, wherein:

5 said light beam generator includes a light emitter assembly and a controller in circuit with said battery and said radio-frequency receiver, for controlling activation of said light emitter assembly when said radio-frequency signal is received by said radio-frequency receiver.

29. The apparatus according to Claim 28, wherein:

10 said light beam generator includes a remote ON/OFF switch in circuit with said controller, said remote ON/OFF switch actuatable by a user for enabling and alternatively disabling remote operation of said light emitter assembly.

30. The apparatus according to Claim 29, wherein:

15 said light beam generator includes a power ON/OFF switch in circuit with said battery and said controller, said power ON/OFF switch actuatable by a user for controlling activation of said light emitter assembly when remote operation of said light emitter assembly is disabled.

31. The apparatus according to Claim 28, wherein:

20 said light beam generator includes a remote ON/OFF switch in circuit with said controller, said remote ON/OFF switch actuatable by a user for enabling and alternatively disabling operation of said radio-frequency receiver.

32. The apparatus according to Claim 31, wherein:

said light beam generator includes a power ON/OFF switch in circuit with said battery and said controller, said power ON/OFF switch actuatable by a

user for controlling ON/OFF operation of said light emitter assembly when operation of said radio-frequency receiver is disabled.

33. The apparatus according to Claim 28, wherein:

5 said light emitter assembly includes a plurality of light source assemblies and a multi-positioned switch, said multi-positioned switch actuable by a user for selecting one of said light source assemblies to be activated by said controller.

34. The apparatus according to Claim 33, wherein:

10 said light beam generator includes a remote ON/OFF switch in circuit with said controller, said remote ON/OFF switch actuable by a user for enabling and alternatively disabling remote operation of the selected one of said light source assemblies.

35. The apparatus according to Claim 34, wherein:

15 said light beam generator includes a power ON/OFF switch in circuit with said battery and said controller, said power ON/OFF switch actuable by a user for controlling ON/OFF operation of said selected one of said light source assemblies when remote operation of said light beam generator is disabled.

36. The apparatus according to Claim 33, wherein:

20 said light beam generator includes a remote ON/OFF switch in circuit with said controller, said remote ON/OFF switch actuable by a user for enabling and alternatively disabling operation of said radio-frequency receiver.

37. The apparatus according to Claim 36, wherein:

25 said light beam generator includes a power ON/OFF switch in circuit with said battery and said controller, said power ON/OFF switch actuable by a user for controlling ON/OFF operation of the selected one of said light source assemblies when operation of said radio-frequency receiver is disabled.

38. Remote switching apparatus comprising:

a gun;

a switch carried by said gun;

5 a radio-frequency transmitter carried by said gun and coupled to said switch for transmitting a radio-frequency signal in response to actuation of said switch; and

10 an electrical appliance having an ON condition and an OFF condition, said electrical appliance including a radio-frequency receiver, said electrical appliance responsive to said radio-frequency receiver receiving said radio-frequency signal for placing said electrical appliance in said ON condition.

39. The apparatus according to Claim 38, wherein:

said electrical appliance is carried by said gun.

40. The apparatus according to Claim 38, including:

15 a housing for said switch and said radio-frequency transmitter, said housing secured to said gun.

41. The apparatus according to Claim 40, wherein:

said housing is configured as a handgrip.

42. The apparatus according to Claim 40, including:

20 a battery disposed in said housing, said battery in circuit with said switch and said transmitter.

43. The apparatus according to Claim 42, including:

25 a controller disposed in said housing and in circuit with said battery, said switch and said radio-frequency transmitter, for controlling said radio-frequency transmitter to transmit said radio-frequency signal in response to actuation of said switch.

44. The apparatus according to Claim 38, wherein:

said electrical appliance is a light beam generator.

45. The apparatus according to Claim 44, wherein:

said light beam generator is adapted to be mounted to said gun.

5 46. The apparatus according to Claim 44, wherein:

said light beam generator includes a remote ON/OFF switch actuable by a user for enabling and alternatively disabling remote operation of said light beam generator.

47. The apparatus according to Claim 46, wherein:

10 said light beam generator includes a light emitter assembly and a power ON/OFF switch actuable by a user for activating said light emitter assembly when remote operation of said light beam generator is disabled.

48. The apparatus according to Claim 44, wherein:

15 said light beam generator includes a remote ON/OFF switch actuable by a user for enabling and alternatively disabling operation of said radio frequency receiver.

49. The apparatus according to Claim 48, wherein:

20 said light beam generator includes a light emitter assembly and a power ON/OFF switch actuable by a user for activating said light emitter assembly when operation of said radio frequency receiver is disabled.

50. Remote control apparatus comprising:

a housing adapted to be mounted to a gun; and

25 a battery, a switch and a radio-frequency transmitter carried by said housing in circuit for transmitting a radio-frequency signal in response to actuation of said switch.

51. The apparatus according to Claim 50, including:

a controller carried by said housing in circuit with said battery, said switch and said radio-frequency transmitter, for controlling said transmitter to transmit said radio-frequency signal in response to actuation of said switch.

5 52. The apparatus according to Claim 50, wherein:

said housing is configured as a handgrip.

53. The apparatus according to Claim 50 including a rail structure secured to the gun, wherein:

10 said housing includes a mounting assembly securable to the rail structure for mounting said housing to the gun.

54. The apparatus according to Claim 53, wherein:

said housing is configured as a handgrip.

55. The apparatus according to Claim 54, wherein:

said switch is a constant ON/OFF switch.

15 56. The apparatus according to Claim 54, wherein:

said switch is a momentary switch.

57. The apparatus according to Claim 55, including:

20 a momentary switch carried by said handgrip in circuit with said battery and said radio-frequency transmitter for transmitting a radio-frequency signal in response to actuation of said momentary switch.

58. The apparatus according to Claim 57, wherein:

said momentary switch and said constant ON/OFF switch are actuatable independently of one another.

59. A method for remotely actuating an electrical appliance, comprising:
providing a gun having a transmitter device thereon;
providing the electrical appliance;
actuating said transmitter device to transmit a radio-frequency signal;
5 detecting said radio-frequency signal at said electrical appliance; and
actuating said electrical appliance in response to said radio-frequency
signal received at said electrical appliance.

60. The method according to Claim 59, wherein:
the gun providing step includes providing said transmitter device and
10 removably mounting said transmitter device to said gun.

61. The method according to Claim 59, wherein:
in the electrical appliance providing step, said electrical appliance
comprises a light beam generator.

62. The method according to Claim 61, wherein:
15 the gun providing step includes providing said transmitter device and
removably mounting said transmitter device to said gun.

63. The method according to Claim 61, wherein:
in the electrical appliance providing step, said light beam generator is
removably secured to said gun.

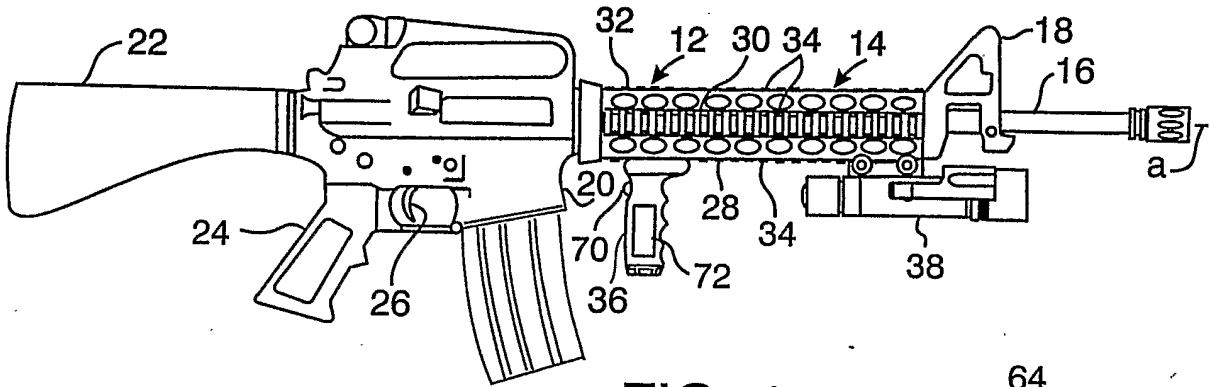


FIG. 1

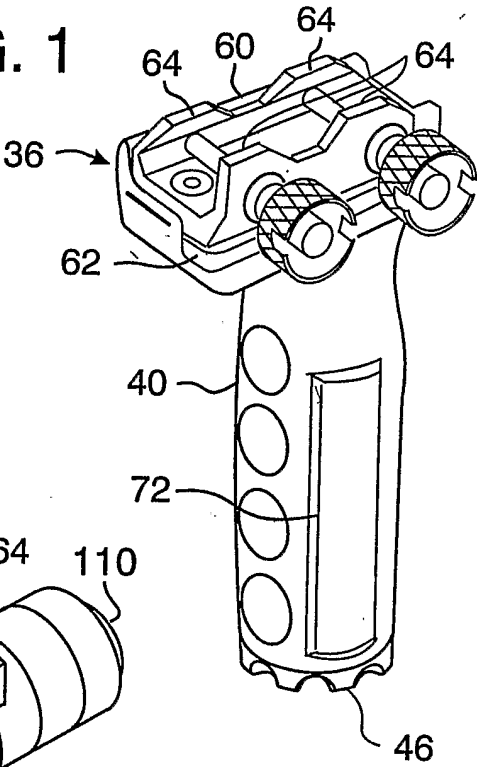


FIG. 2

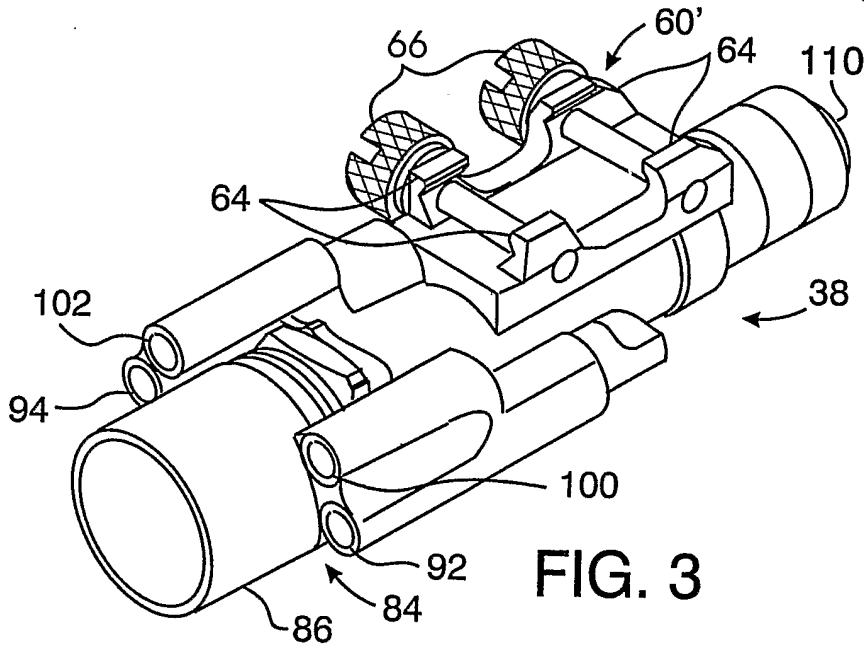


FIG. 3

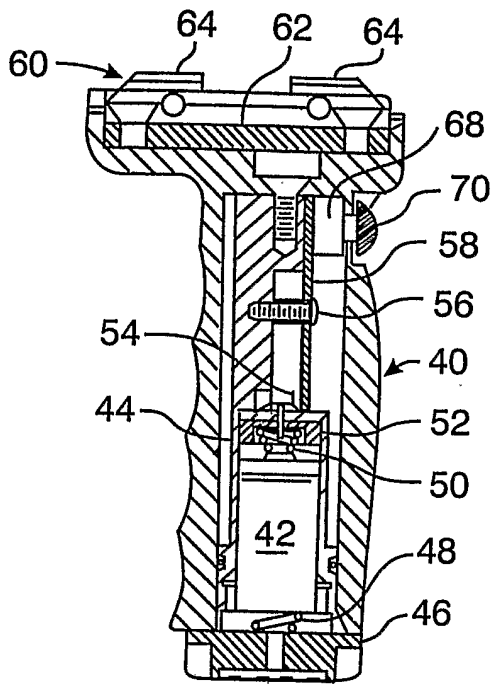


FIG. 5

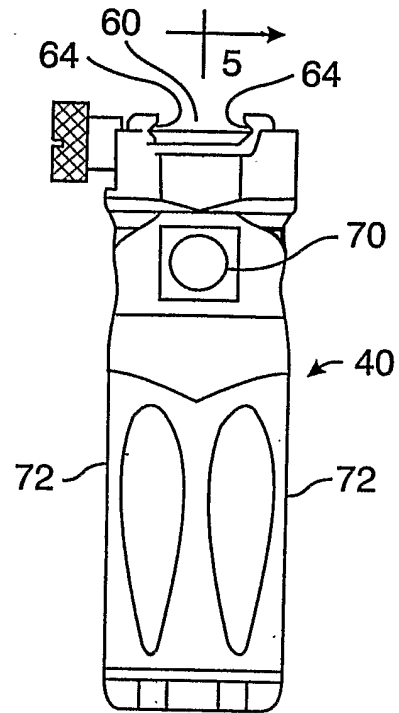


FIG. 4

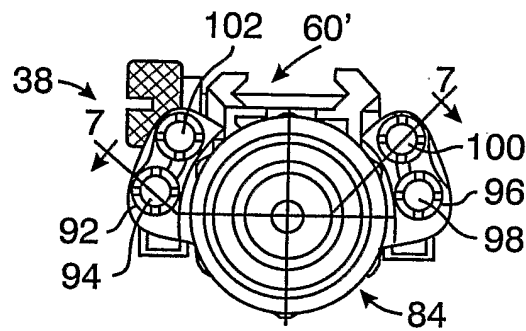


FIG. 6

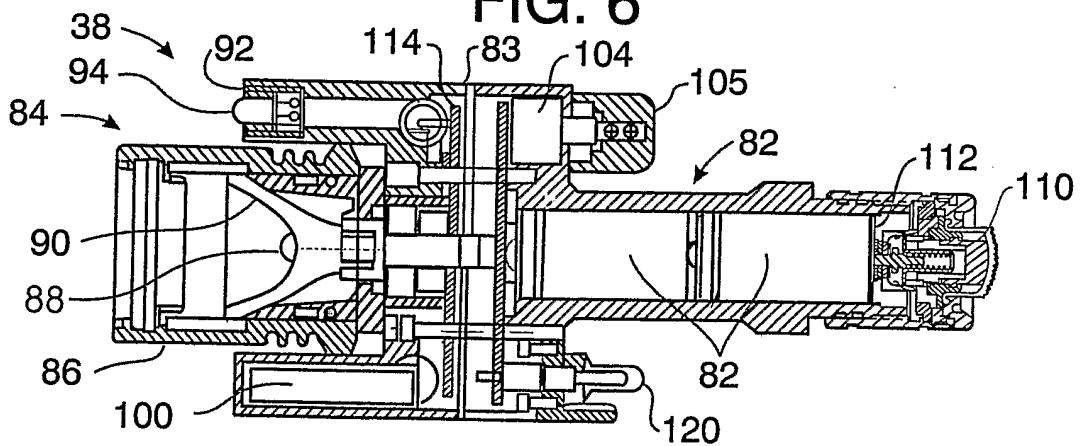


FIG. 7

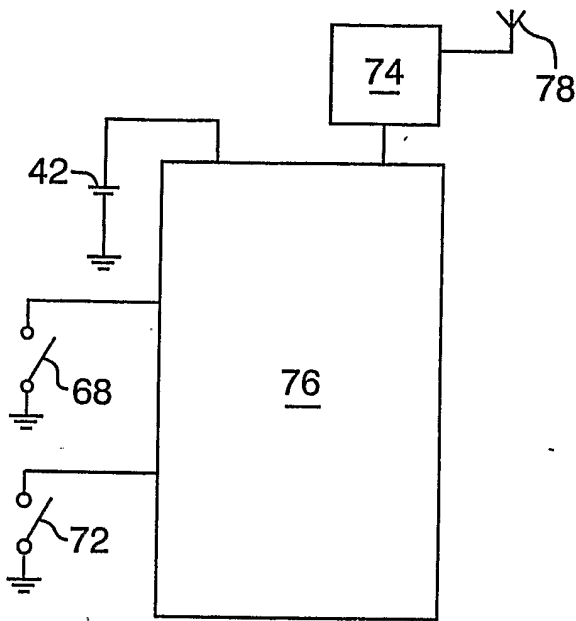


FIG. 8

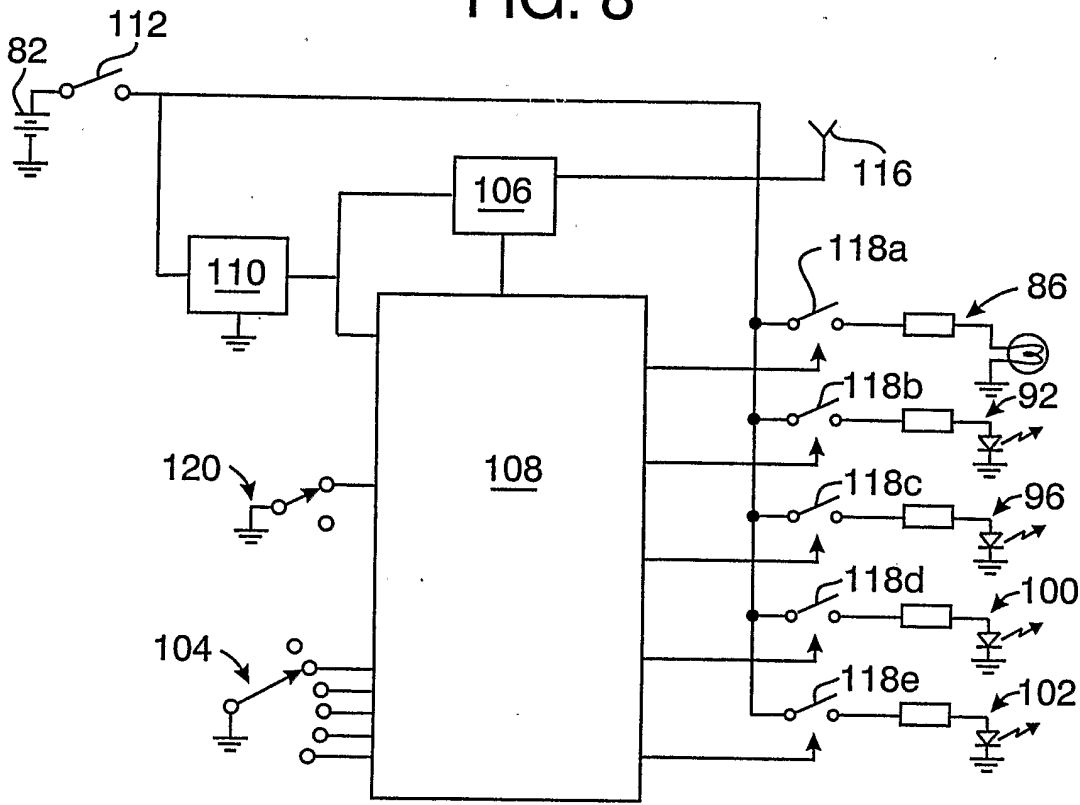


FIG. 9