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(54) **SMART SHOOTING RANGE**

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Publication Classification

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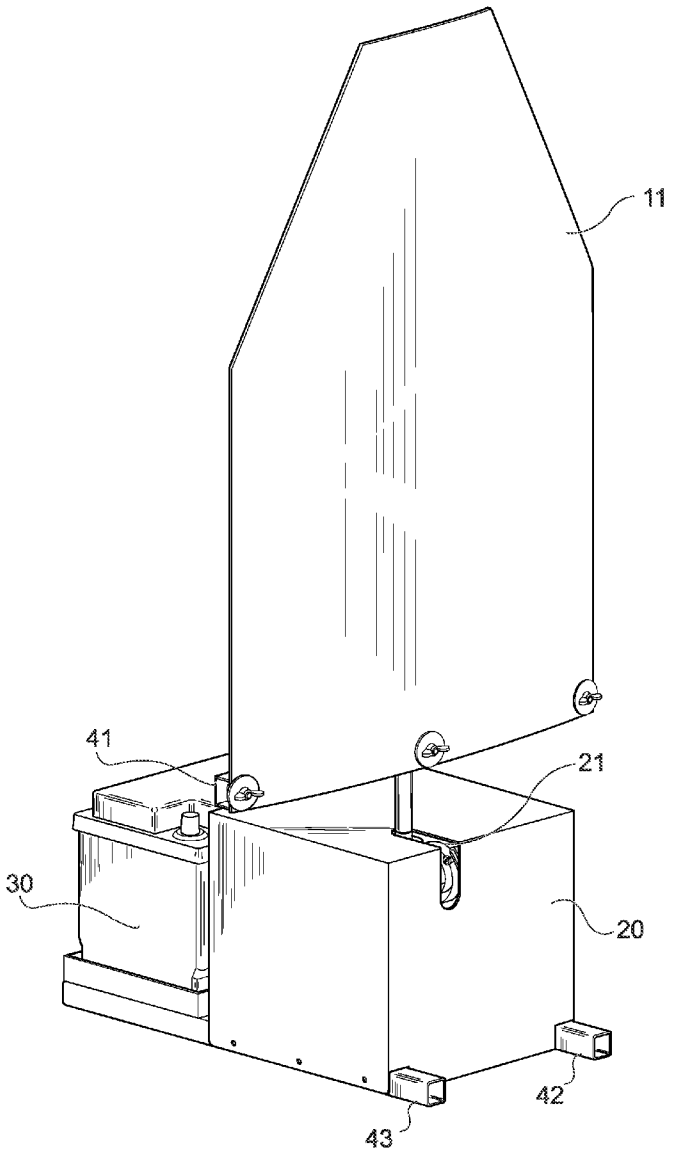
F41J 7/00 (2006.01)

(52) **U.S. Cl.** **273/406**

(57) **ABSTRACT**

An intelligent shooting having features and props able to be control and monitored wirelessly and remotely is disclosed. Further novel shooting target designs are additionally disclosed herein having external power supplies configured therewith. In a preferred embodiment, a first target of the present invention can be rotated in either direction about a vertical axis to optionally simulate friendly or unfriendly target. Also in this embodiment the target can rotate about a horizontal axis to simulate an engaged or unengaged target, or target eliminated. The present invention also contemplates wireless control and monitoring of target range features such as lighting systems, feedback alarms, and motion sensors, in addition to scene props such as smoke and acoustical simulators.



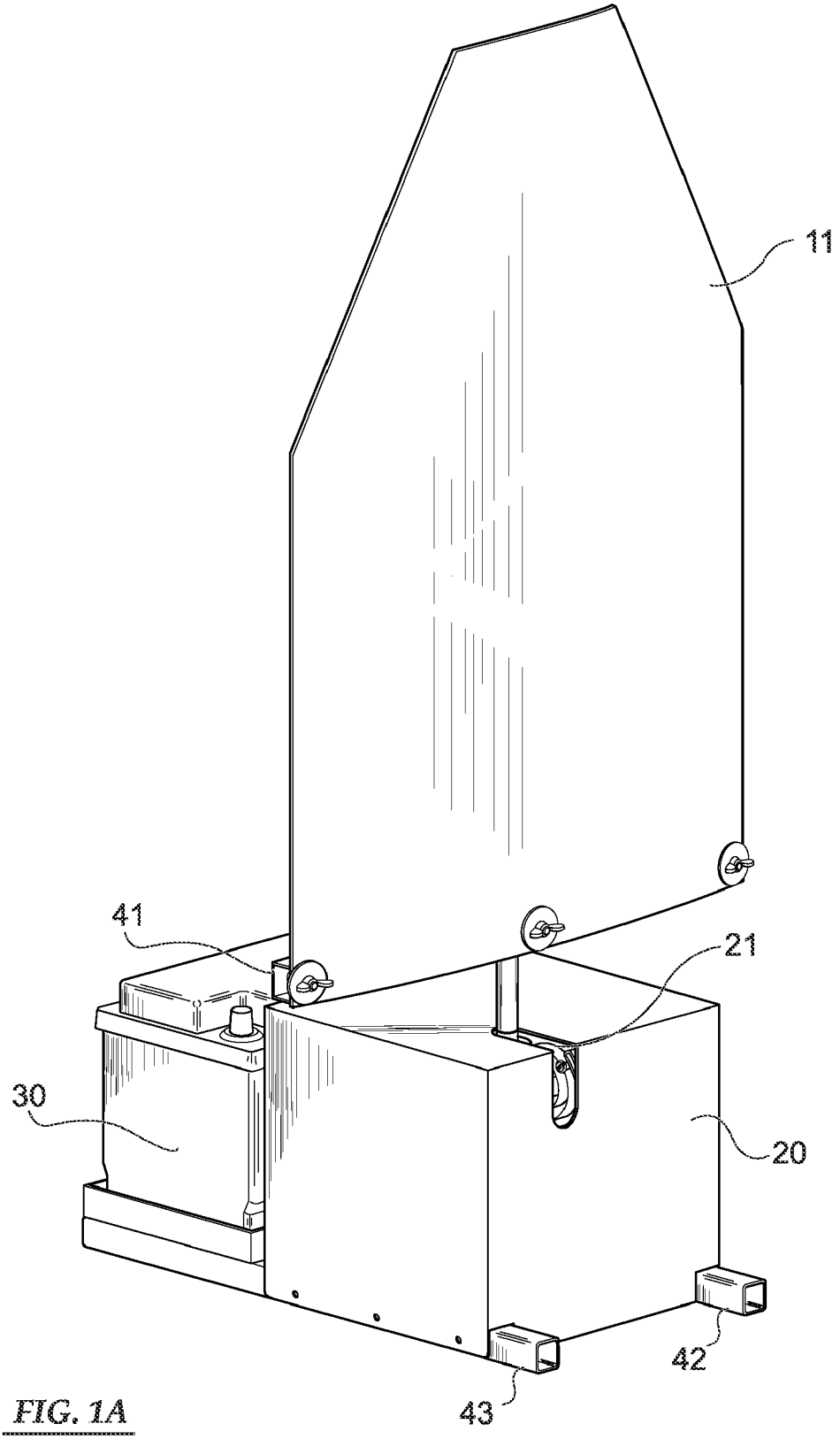


FIG. 1A

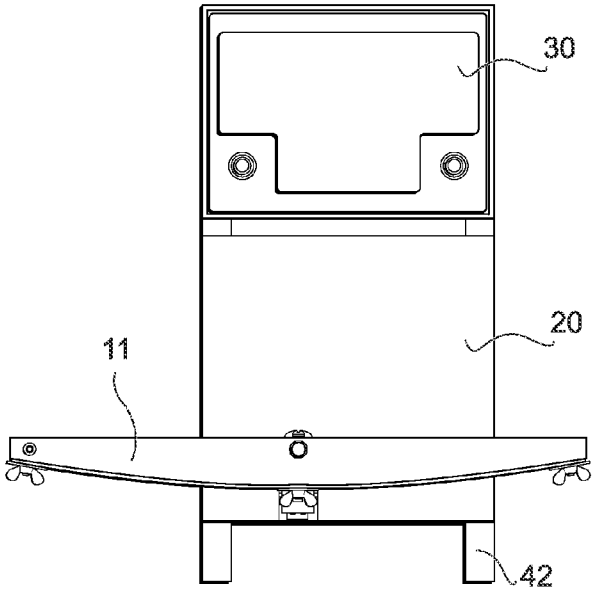


FIG. 1B

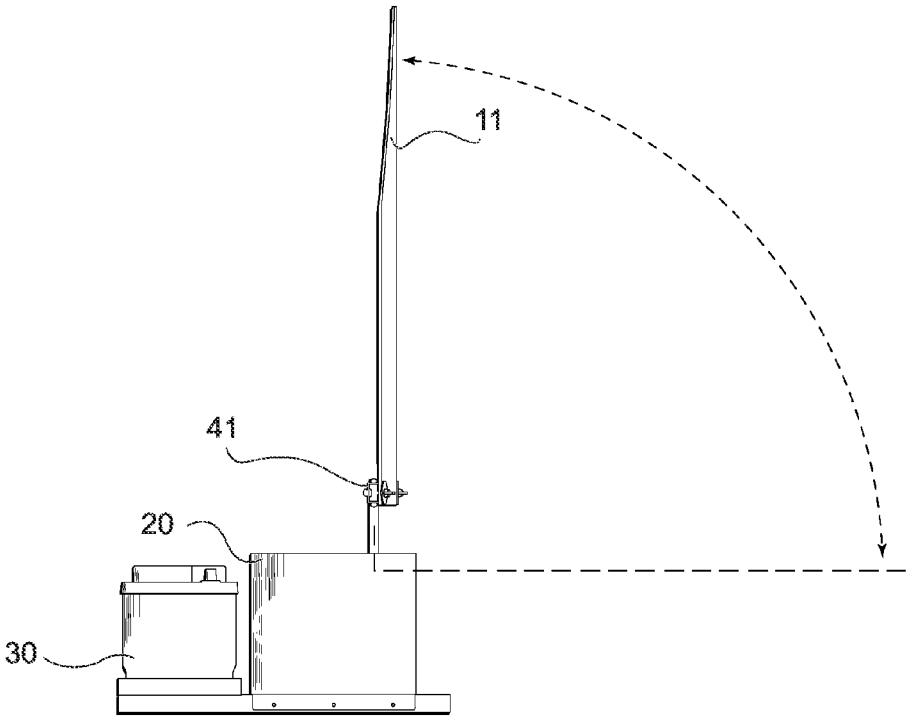


FIG. 1C

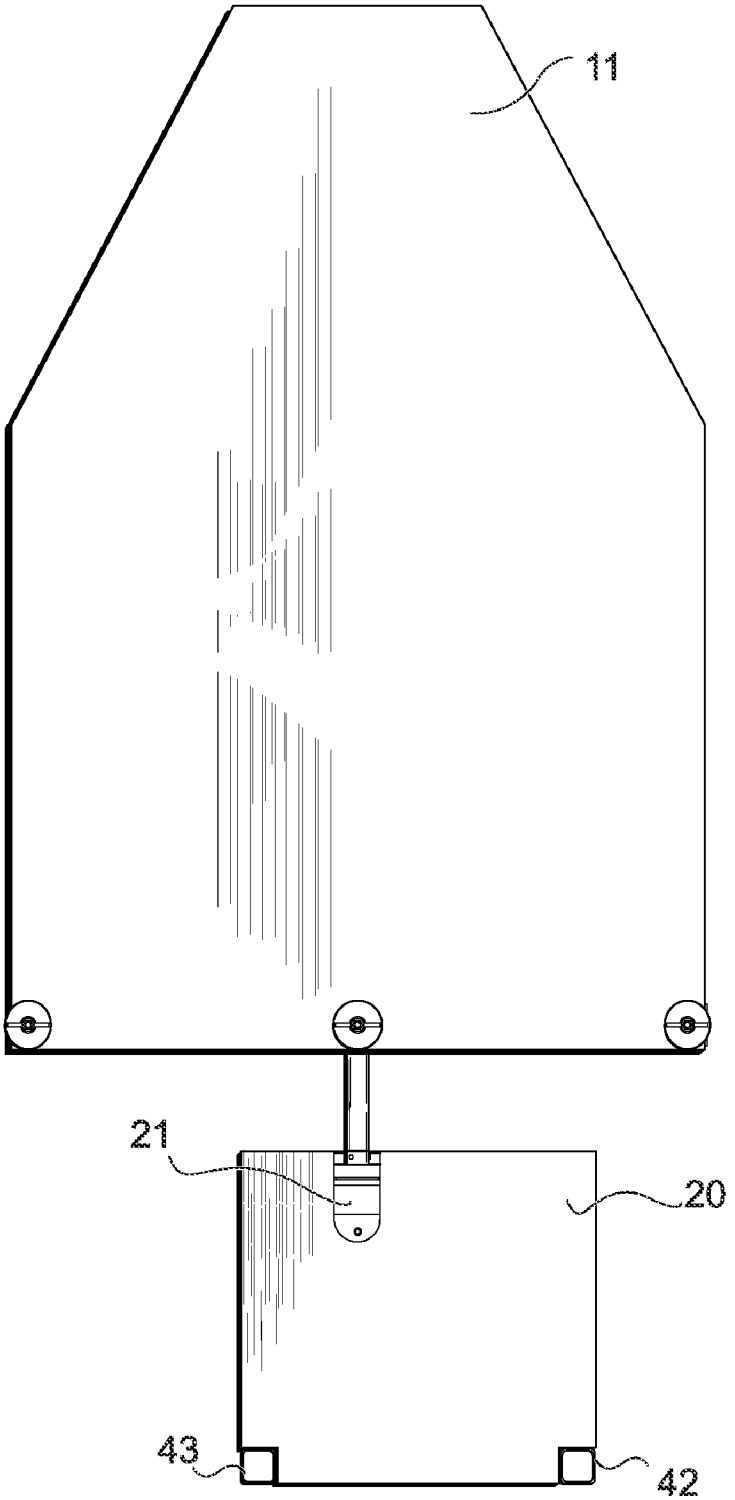


FIG. 1D

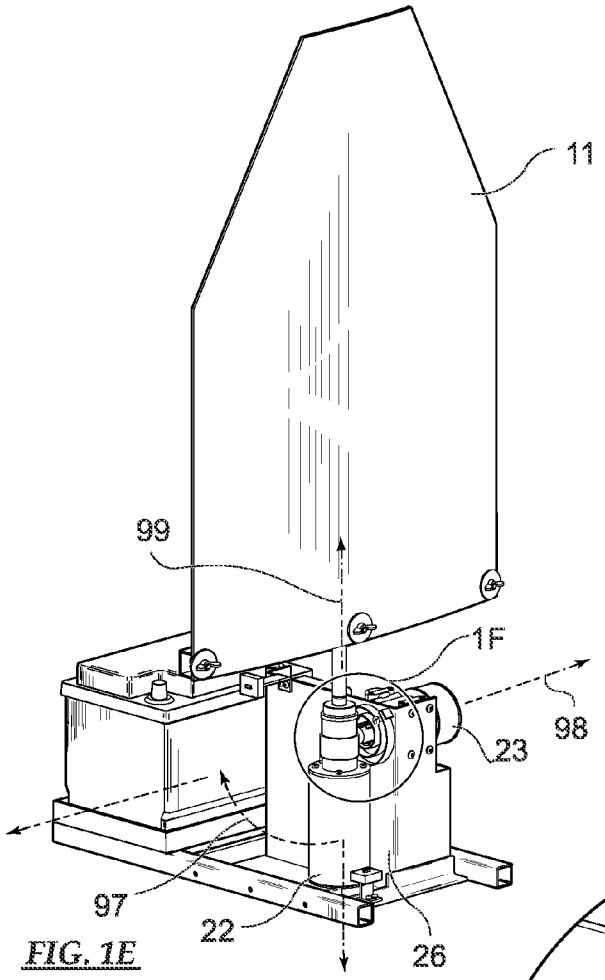


FIG. 1E

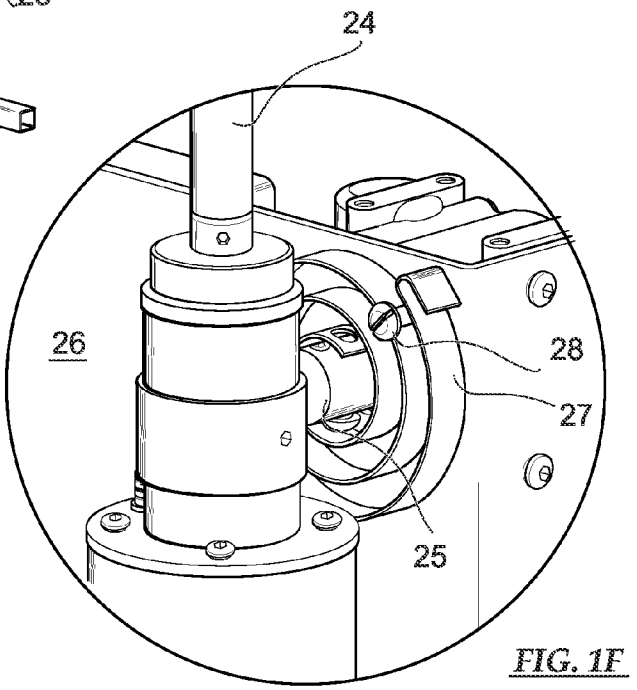


FIG. 1F

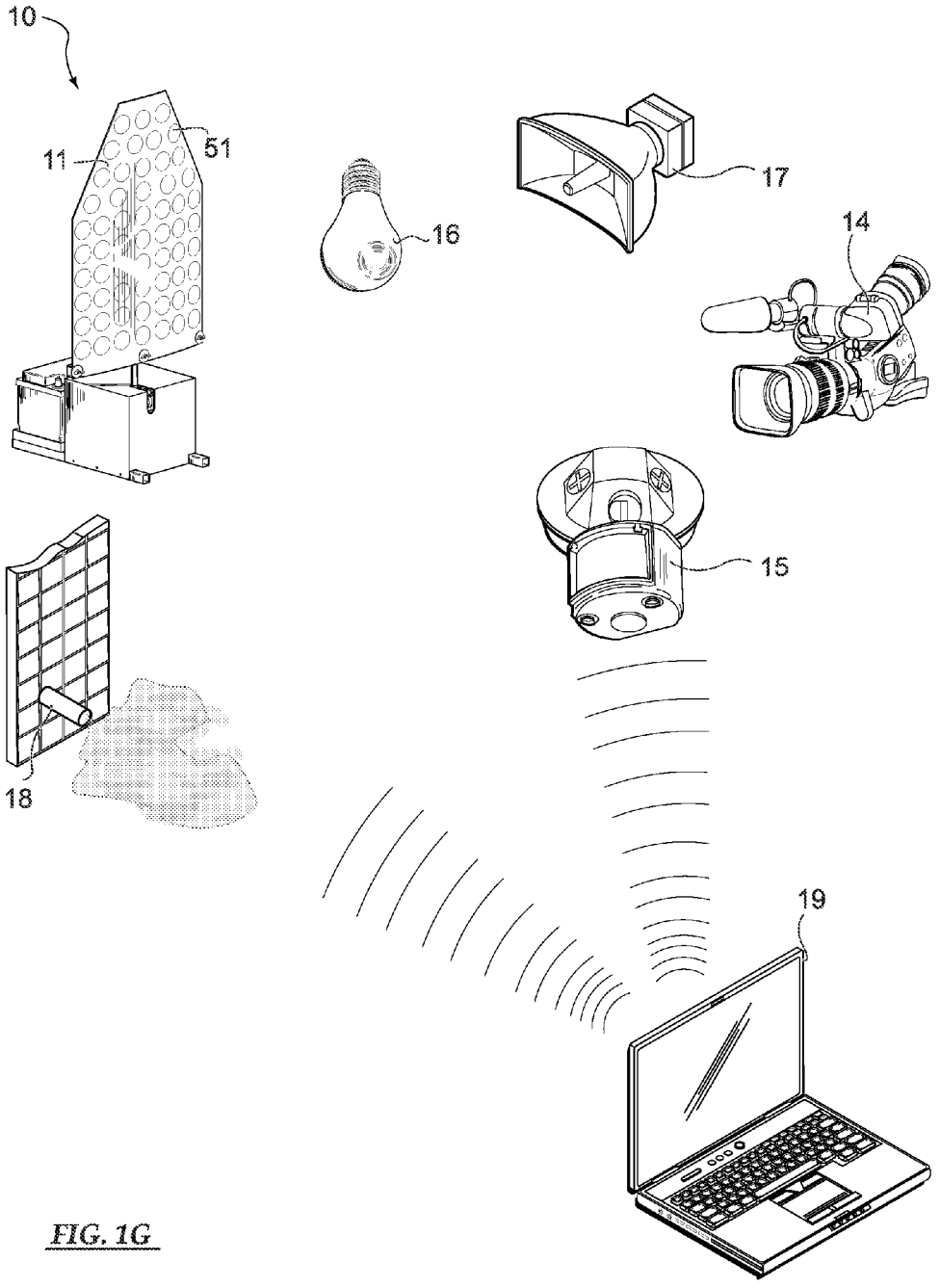


FIG. 1G

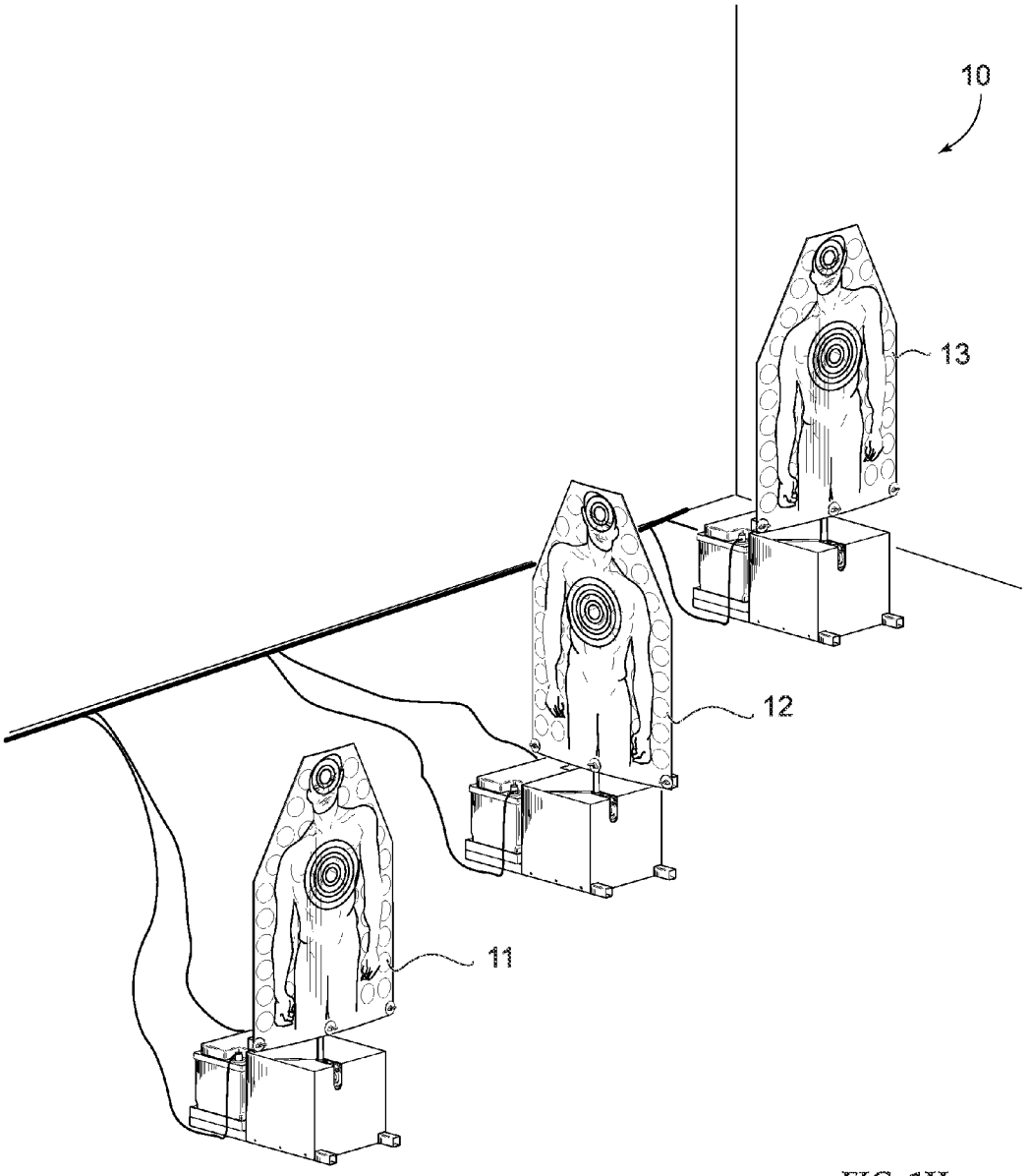


FIG. 1H

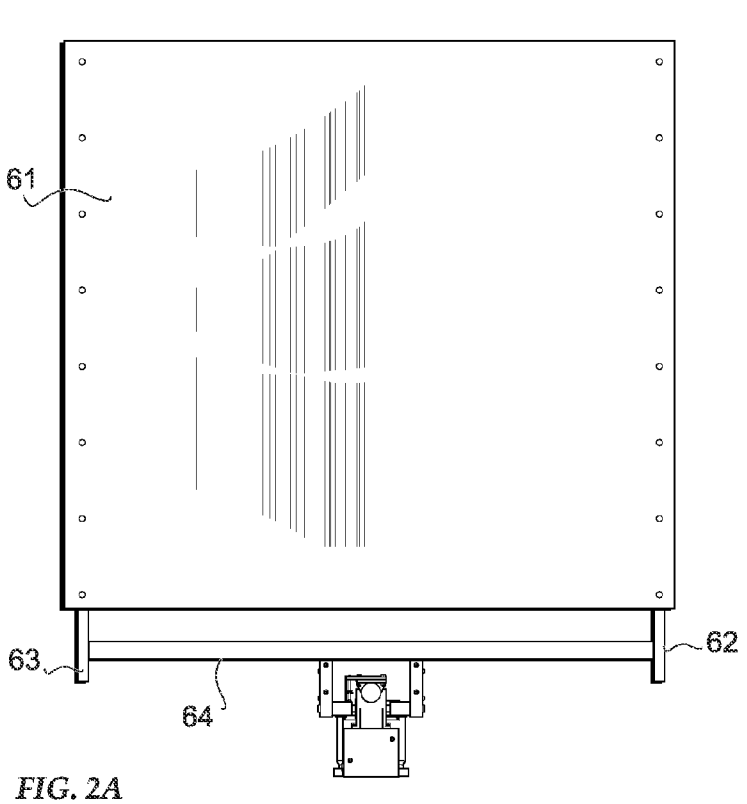


FIG. 2A

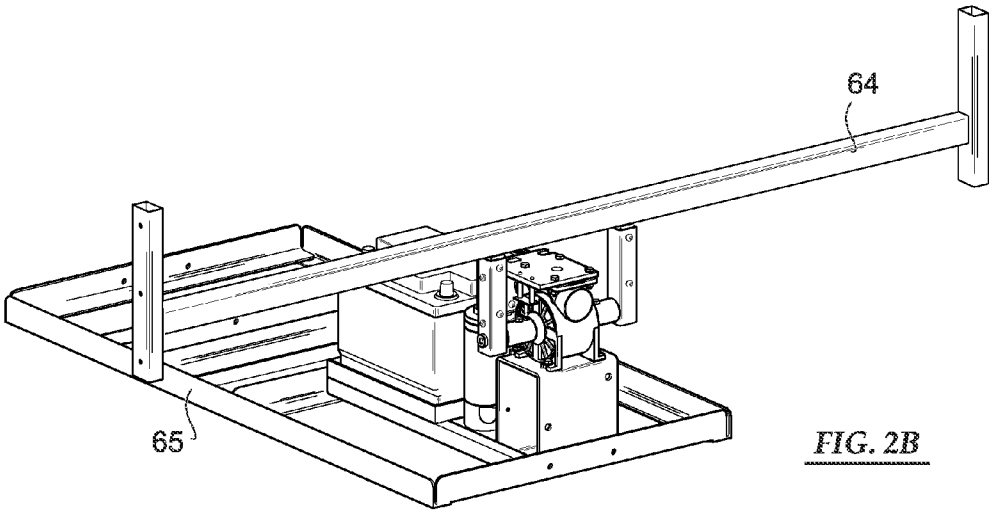


FIG. 2B

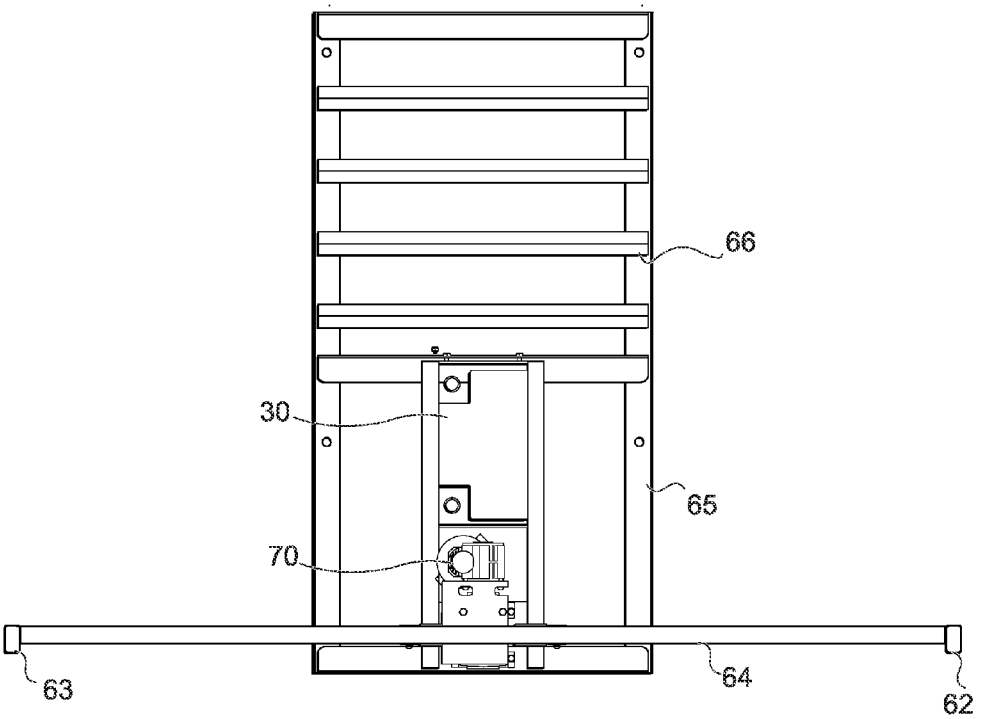


FIG. 2C

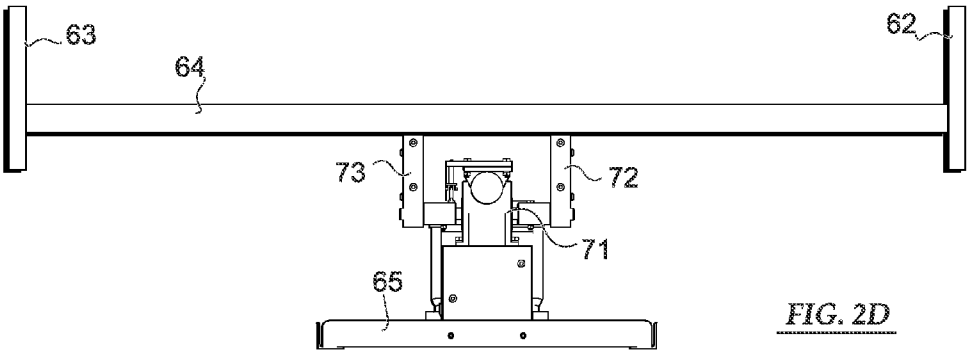


FIG. 2D

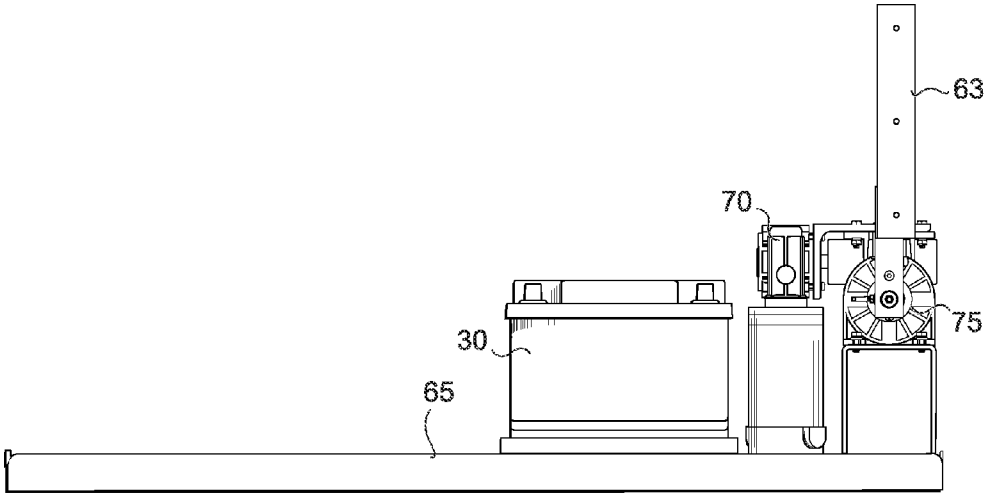


FIG. 2E

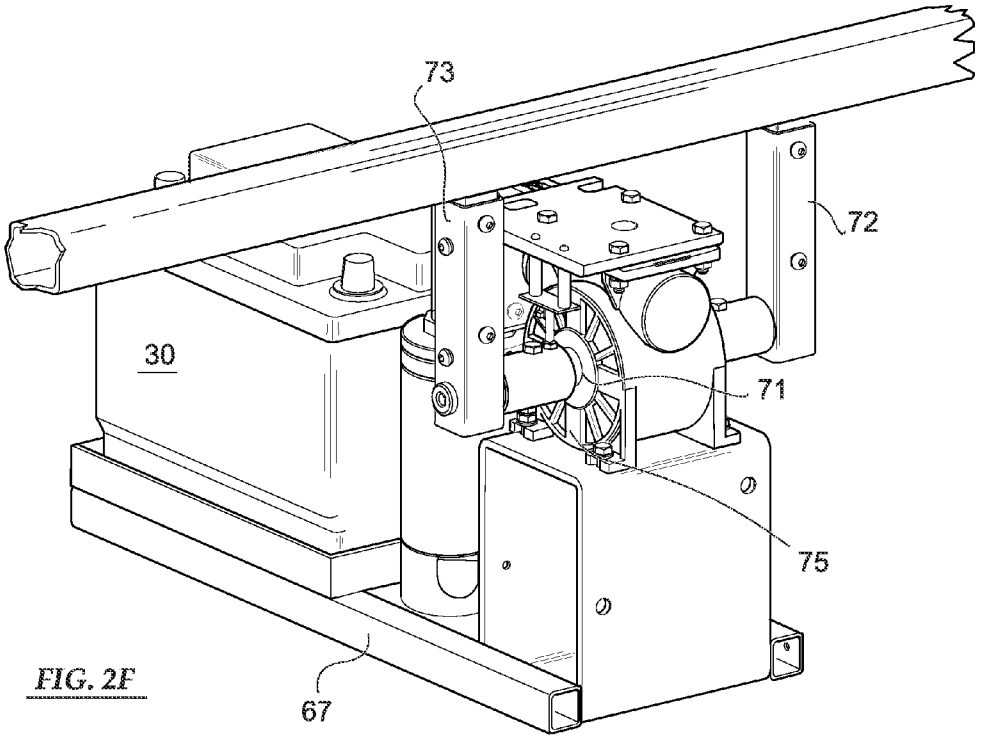


FIG. 2F

SMART SHOOTING RANGE

PRIORITY CLAIM

[0001] This patent application contains subject matter claiming benefit of the priority date of U.S. Provisional Patent Application Ser. No. 61/296,257 filed on Jan. 19, 2010 and entitled SMART SHOOTING RANGE, accordingly, the entire contents of this provisional patent application is hereby expressly incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates generally to facilities designed for weapons and firearms training. More particularly, the invention relates to an advanced capability shooting range employing intelligent command and controls.

[0004] 2. Description of the Prior Art

[0005] Today, it is ever more important for the gun owner, law enforcement officer, soldier or marine to always maintain preparedness and shooting proficiency by regularly participating in tactical training exercises. While most target practice is accomplished in permanent indoor and/or outdoor facilities, it has become increasingly important to conduct engagement and target exercises in remote locations. It is further important to closely simulate actual tactual or combat situations with live rounds that cannot be fully achieved with video equipment.

[0006] Hence, it is an object of the present invention to provide an advanced capability target shooting system and method having wireless and programmable control. It is further an object of the present invention to provide a system that is able to monitor results contemporaneously rather than having to inspect targets at a later time. It is still further an object of the present invention to provide a target system that has a self-contained, rechargeable electrical source that it does not rely on external power. It is still further an object of the present invention to integrate a lighting system to the target range that also can be controlled remotely. It is yet still further to provide a target system that is able to detect and recognize an individual shooter in relative proximity to a plurality of targets. It is yet still further an object of the present invention to provide a firearm shooting target that is mechanically able to rotate about two axes individually or simultaneously.

[0007] These, as well as other advantages of the present invention will be more apparent from the following description and drawings. It is understood that changes in the specific structure shown and described may be made within the scope of the claims, without departing from the spirit of the invention.

BRIEF SUMMARY OF THE INVENTION

[0008] The present invention specifically addresses and alleviates the above mentioned deficiencies associated with the prior art. More particularly, the present invention in a first aspect, is a target shooting range comprising: a first substantially planar target; a first electrical motor coupled to the first substantially planar target about a vertical shaft, the vertical shaft about a vertical axis; and a second electrical motor about a horizontal shaft about a horizontal axis, the second electrical motor further coupled to the first substantially planar target via the vertical shaft, and via the horizontal shaft, the first substantially planar target simulating either friend or foe or target appearing or target disappearing or threat terminated.

[0009] The invention in this aspect is additionally characterized wherein target shooting range further includes a horizontal length of steel tube coupled to the vertical shaft t and providing structural support to the first substantially planar target. Also, a housing is provided for enclosing the first motor and the second motor and the horizontal shaft, the housing further having a slot therein, the vertical axis rotating about the slot; and a power supply is provided external to the housing and adjacent thereto.

[0010] The invention in this aspect is further characterized as having a transreceiver coupled to the first electrical motor; and a computer device in communication with the transreceiver providing command and control to the target shooting range. The invention in this aspect is additionally characterized as including second and subsequent substantially planar targets, the first, second and subsequent substantially planar targets providing a simulated tactical scenario to a user. Yet further, the target shooting range in this aspect comprises: a planar structural support member about the horizontal axis and perpendicular axis; a spiral support member adjacent to and supported by the planar structural support member; the spiral support member fixed to the horizontal shaft so that the spiral support member rotates with the horizontal shaft; and a support pin engaging the spiral support member and fixed to the planar structural member proving support to the first substantially planar target when the first substantially planar target rotates about the horizontal shaft.

[0011] In a second aspect, the invention is characterized as target shooting range comprising: a first substantially rectangular target; a plurality of electro-mechanical components coupled to a rechargeable battery for converting electrical potential to mechanical rotational work, the plurality of electro-mechanical components coupled to the first substantially rectangular target; and an H-frame for supporting and engaging the first substantially planar target.

[0012] The target shooting range in the second aspect is further characterized wherein the H-frame comprises two upright bars and a cross bar. Also according to the invention, the plurality of electro-mechanical components comprise an electrical motor, a horizontal shaft and a counter balancing weight for providing stabilization for the substantially rectangular target, further wherein the a pair of riser bars couple the horizontal shaft to the H-frame and wherein the riser bars comprise steel tube material. Further to this invention embodiment, the support base comprises a rectangular frame having a plurality of support slats width-wise across the rectangular frame, the rectangular frame further comprising four elongated "L" frame lengths of steel.

[0013] These, as well as other advantages of the present invention will be more apparent from the following description and drawings. It is understood that changes in the specific structure shown and described may be made within the scope of the claims, without departing from the spirit of the invention.

[0014] While the apparatus and method has or will be described for the sake of grammatical fluidity with functional explanations, it is to be expressly understood that the claims, unless expressly formulated under 35 USC 112, are not to be construed as necessarily limited in any way by the construction of "means" or "steps" limitations, but are to be accorded the full scope of the meaning and equivalents of the definition

provided by the claims under the judicial doctrine of equivalents, and in the case where the claims are expressly formulated under 35 USC 112 are to be accorded full statutory equivalents under 35 USC 112. The invention can be better visualized by turning now to the following drawings wherein like elements are referenced by like numerals.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015] The novel features of this invention, as well as the invention itself, both as to its structure and its operation, will be best understood from the accompanying drawings, taken in conjunction with the accompanying description, in which similar reference characters refer to similar parts, and in which:

[0016] FIG. **1**A is a rear perspective illustration of a first preferred shooting target of the present invention;

[0017] FIG. **1**B is a top plan view the first preferred embodiment;

[0018] FIG. **1**C is a profile view of the invention embodiment with exemplary range of motion;

[0019] FIG. **1**D is a rear view of the invention embodiment;

[0020] FIG. **1**E is a rear perspective view of the shooting target with the housing for components removed as to reveal mechanical linkages;

[0021] FIG. **1**F is an enlarged view of area defined by line **1**F in FIG. **1**E;

[0022] FIG. **1**G is a schematical illustration of various features of a preferred target shooting range;

[0023] FIG. **1**H is a frontal perspective view of several target embodied by the present invention;

[0024] FIG. **2**A is a front plan view of a second preferred invention embodiment;

[0025] FIG. **2**B is a perspective illustration thereof;

[0026] FIG. **2**C is a top plan view of the second preferred embodiment;

[0027] FIG. **2**D is a rear view of a second preferred invention embodiment;

[0028] FIG. **2**E is a profile view thereof; and

[0029] FIG. **2**F is an enlarged view of that illustrated in FIG. **2**B.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENTS

[0030] With regard to FIG. **1**A, a rear perspective illustration of a first preferred shooting target of the present invention is provided. Generally the invention comprises a pivotally mounted target **11**, a housing **20** for electro-mechanical components **22**, **23**, **24**, **25**, **26**, **27**, **28**, and a rechargeable battery **30**. The target is mounted on a T-frame with fasteners such as screws that can be hand tightened as many targets will be employed and subsequently removed in the lifetime of a particular unit. Specifically the T-frame is formed by vertical shaft **24** about vertical axis **99** coupled to a horizontal length of steel tube **41** coupled to the vertical shaft **24** for providing structural support to the first substantially planar target **11**.

[0031] FIG. **1**B and FIG. **1**C, provide additional views of the present invention shooting target. Slot **21** in housing is provided to allow for shaft to rotate from and upright position to an unengaged position as demonstrated by the directional arrow in FIG. **1**C. With further reference to and FIG. **1**D, the target is supported by parallel lengths of steel tube **42**, **43**.

[0032] With regard to FIG. **1**E, a rear perspective view of the shooting target is shown with the housing **20** for mechanical components removed as to illustrate mechanical linkages **22**, **23**, **24**, **25**, **26**, **27**, **28**. Electric motors **22**, **23** drive the linkages and importantly, the target is rotatable about both horizontal **98** and vertical axes **99**. In this way, the target can be versatile to simulate particular tactical scenarios. For example, the substantially planar target **11** can rotate from an unengaged position to the engaged position about either axis **98**, **99**. Also, from the unengaged profile position, it could rotate in either direction to simulate an unfriendly target or a friendly non-target. All such action is programmable according to the present invention also employing wireless electronics (FIG. **1**G).

[0033] Additionally according to the invention **10** (FIG. **1**G), the target is fitted with a pressure sensor array **51**, such that when an accurate hit(s) are scored, the target **11** will rotate to the unengaged (dead) position. Further, all action **11**, **14**, **15**, **16**, **17**, **18** is able to be monitored in real time as shown in FIG. **1**G. As shown, the invention **10** also contemplates multiple additional features able to be controlled remotely, including: video systems **14**, motion sensors **15**, lighting systems **16**, feedback alarms, in addition to scene props such as smoke **18** and acoustical simulators **17**.

[0034] FIG. **2**A through FIG. **2**F detail a second preferred embodiment **60** of the present invention. The invention embodiment generally comprises a rechargeable battery **30**, electro-mechanical components **70** coupled to a horizontal shaft **71** further coupled to an H-frame **62**, **63**, **64** supported by a relatively large base **65**. Since the second preferred embodiment **60** is much larger than the first **11**, the second adds weights **75** for counter balance and a large stabilizing support base **65**.

[0035] More particularly with regard to FIG. **2**A and FIG. **2**B, horizontal bar **64** is flanked by two upright bars **62**, **63** bars forming an H-frame **62**, **63**, **64**, wherein the substantially planar target **61** is mounted thereto. FIG. **2**C illustrates a top plan view thereof. As shown in FIG. **2**B and in FIG. **2**C, support base **65** comprises comprising a rectangular frame **65** having a plurality of support slats **66** width-wise across the rectangular frame, wherein the rectangular frame further comprises four elongated "L" frame lengths of steel.

[0036] With regard to FIG. **2**D through FIG. **2**F the H-frame **62**, **63**, **64** are linked to a plurality of electro-mechanical components **70**, **71**, **75** coupled to a rechargeable battery **30** for converting electrical potential to mechanical rotational work. More particularly, the plurality of electro-mechanical components **70**, **71**, **75** comprise an electrical motor **70** a horizontal shaft **71** and a counter balancing wheel **75** about the shaft **71** for providing stabilization of the target **60**. The electro-mechanical components could alternatively employ and electrical solenoid in lieu of the motor **70**. Also, as shown in FIG. **2**F, the battery **30**, the plurality of electro-mechanical components **70**, **71**, **75** are supported by two lengths of steel tube **67** within the rectangular support frame **65**.

[0037] Many alterations and modifications may be made by those having ordinary skill in the art without departing from the spirit and scope of the invention. Therefore, it must be understood that the illustrated embodiments have been set forth only for the purposes of example and that it should not be taken as limiting the invention as defined by the following claims. For example, notwithstanding the fact that the elements of a claim are set forth below in a certain combination, it must be expressly understood that the invention includes

other combinations of fewer, more or different elements, which are disclosed in above even when not initially claimed in such combinations.

[0038] While the particular Smart Shooting Range as herein shown and disclosed in detail is fully capable of obtaining the objects and providing the advantages herein before stated, it is to be understood that it is merely illustrative of the presently preferred embodiments of the invention and that no limitations are intended to the details of construction or design herein shown other than as described in the appended claims.

[0039] Insubstantial changes from the claimed subject matter as viewed by a person with ordinary skill in the art, now known or later devised, are expressly contemplated as being equivalently within the scope of the claims. Therefore, obvious substitutions now or later known to one with ordinary skill in the art are defined to be within the scope of the defined elements.

What is claimed is:

1. A target shooting range comprising:

a first substantially planar target;

a first electrical motor coupled to the first substantially planar target about a vertical shaft, the vertical shaft about a vertical axis; and

a second electrical motor about a horizontal shaft about a horizontal axis, the second electrical motor further coupled to the first substantially planar target via the vertical shaft, and via the horizontal shaft, the first substantially planar target simulating either friend or foe or target appearing or target disappearing or threat terminated.

2. The target shooting range of claim **1**, further comprising:

a horizontal length of steel tube coupled to the vertical shaft t and providing structural support to the first substantially planar target;

a housing for enclosing the first motor and the second motor and the horizontal shaft, the housing further having a slot therein, the vertical axis rotating about the slot; and

a power supply external to the housing and adjacent thereto.

3. The target shooting range of claim **1**, further comprising;

a transreceiver coupled to the first electrical motor; and

a computer device in communication with the transreciever providing command and control to the target shooting range.

4. The target shooting range of claim **1**, further comprising second and subsequent substantially planar targets, the first, second and subsequent substantially planar targets providing a simulated tactical scenario to a user.

5. The target shooting range of claim **1**, further comprising:

a planar structural support member about the horizontal axis and perpendicular axis; a

a spiral support member adjacent to and supported by the planar structural support member; the spiral support member fixed to the horizontal shaft so that the spiral support member rotates with the horizontal shaft; and

a support pin engaging the spiral support member and fixed to the planar structural member proving support to the first substantially planar target when the first substantially planar target rotates about the horizontal shaft.

6. A target shooting range comprising:

a first substantially rectangular target;

a plurality of electro-mechanical components coupled to a rechargeable battery for converting electrical potential to mechanical rotational work, the plurality of electro-mechanical components coupled to the first substantially rectangular target; and

an H-frame for supporting and engaging the first substantially planar target.

7. The target shooting range of claim **6** wherein the H-frame comprises two upright bars and a cross bar.

8. The target shooting range of claim **6** wherein the plurality of electro-mechanical components comprise an electrical motor, a horizontal shaft and a counter balancing weight for providing stabilization for the substantially rectangular target, further wherein the a pair of riser bars couple the horizontal shaft to the H-frame and wherein the riser bars comprise steel tube material.

9. The target shooting range of claim **6**, further comprising a support base, the support base comprising a rectangular frame having a plurality of support slats width-wise across the rectangular frame, the rectangular frame further comprising four elongated "L" frame lengths of steel.

* * * * *