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(54) **DUMBBELL SAFETY, DEFENSIVE AND ALERTING ASSEMBLY**

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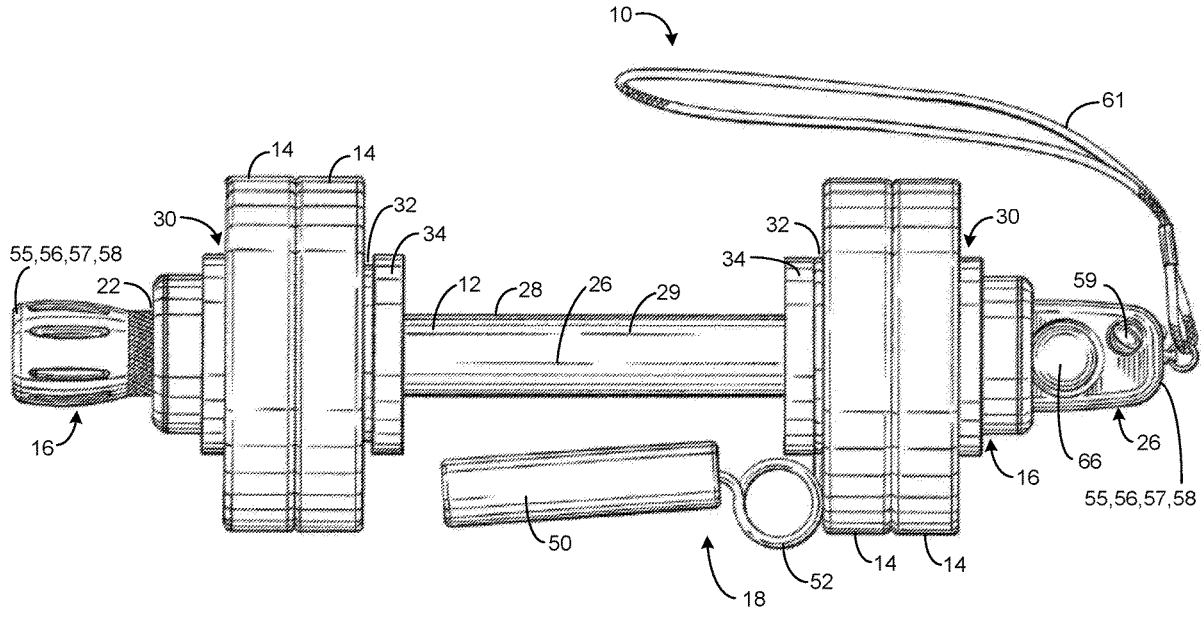
(57) **ABSTRACT**

An exercise device having a bar with a first handle, a grip exerciser having a second handle connected to the bar via a resistance member proximate the first handle and moveable between a first position and a second position by a hand of a user; and an auxiliary device connected to the bar selected from a light assembly, a sound generator, an electrified defensive unit, a pressurized defensive unit, and combinations of the same.



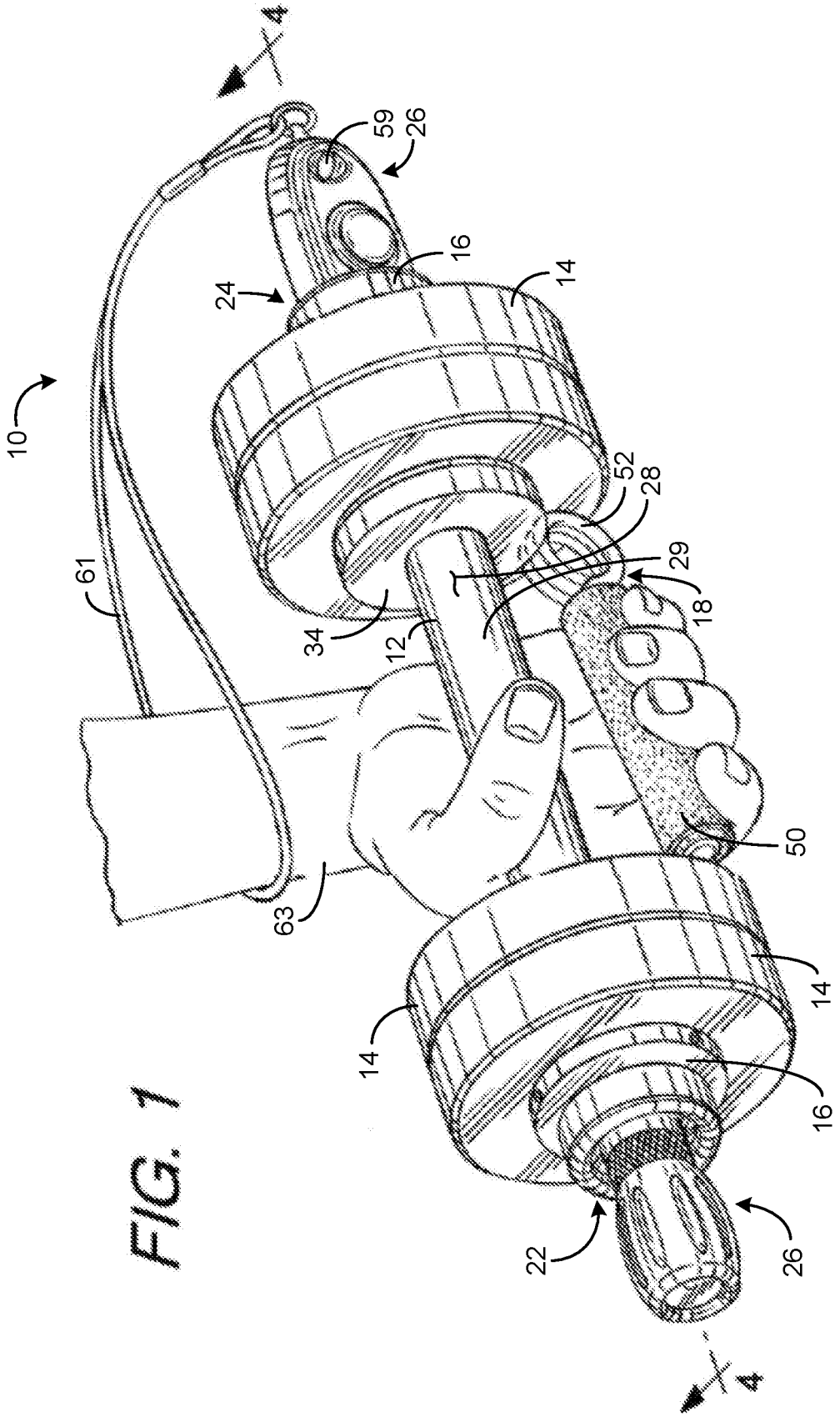


FIG. 1

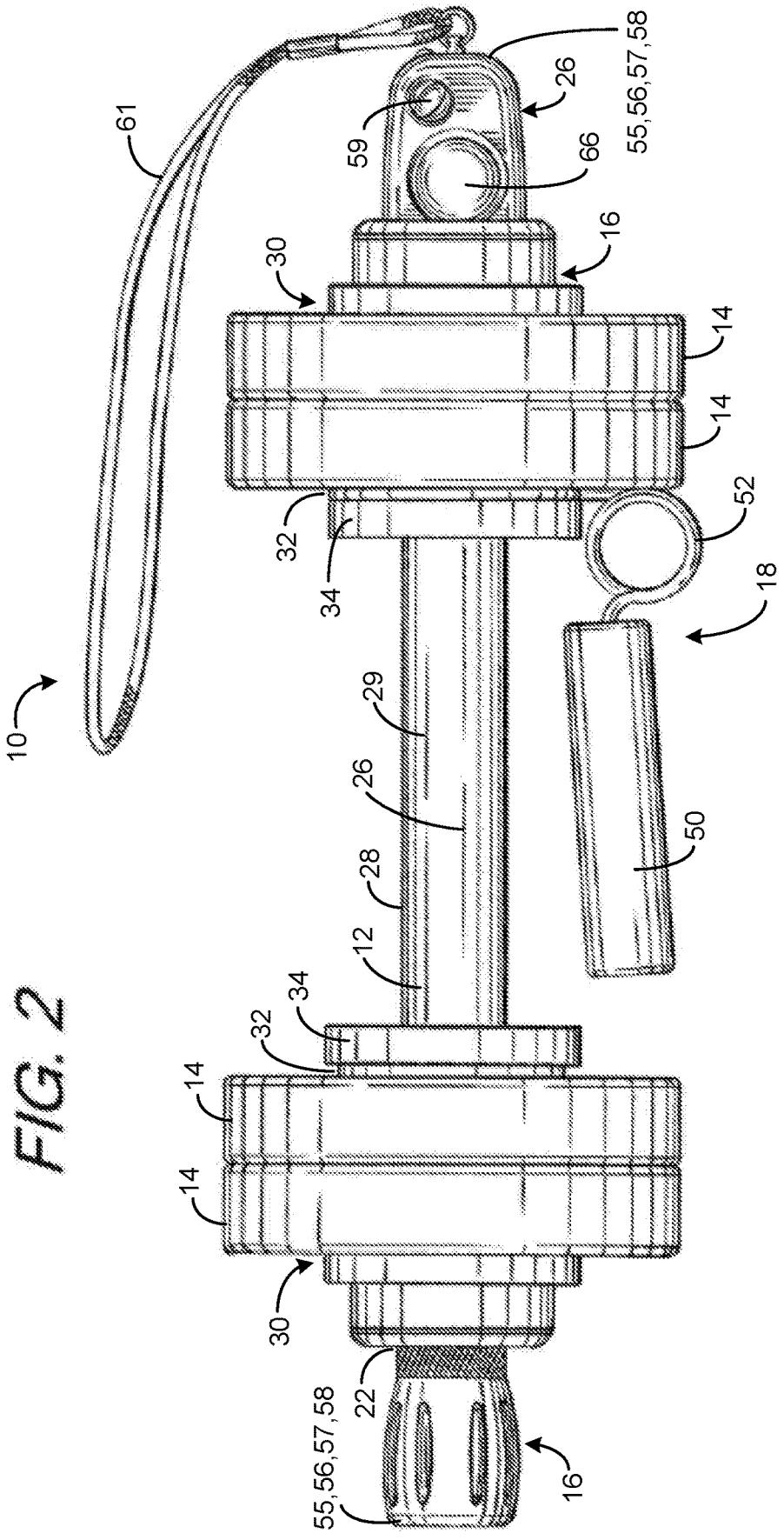

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FIG. 2

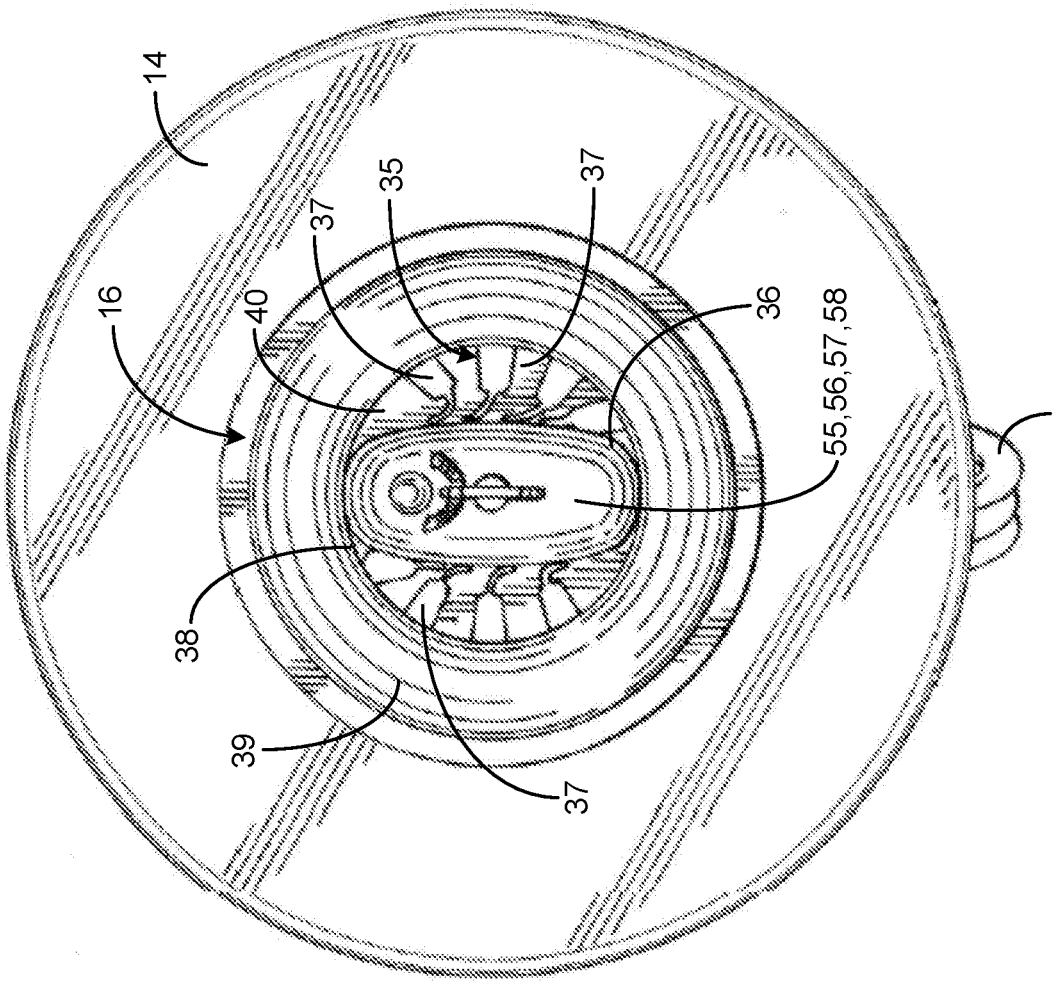

FIG. 3

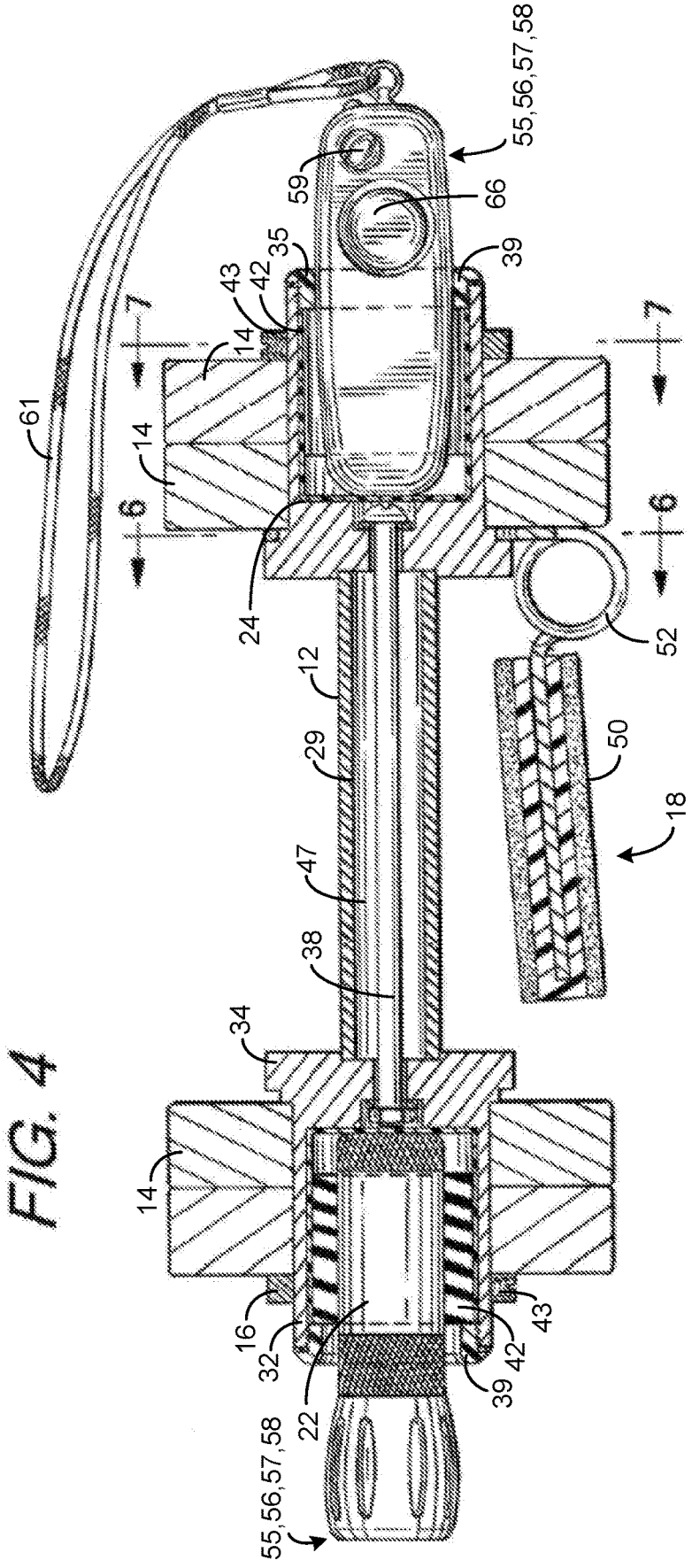
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FIG. 4

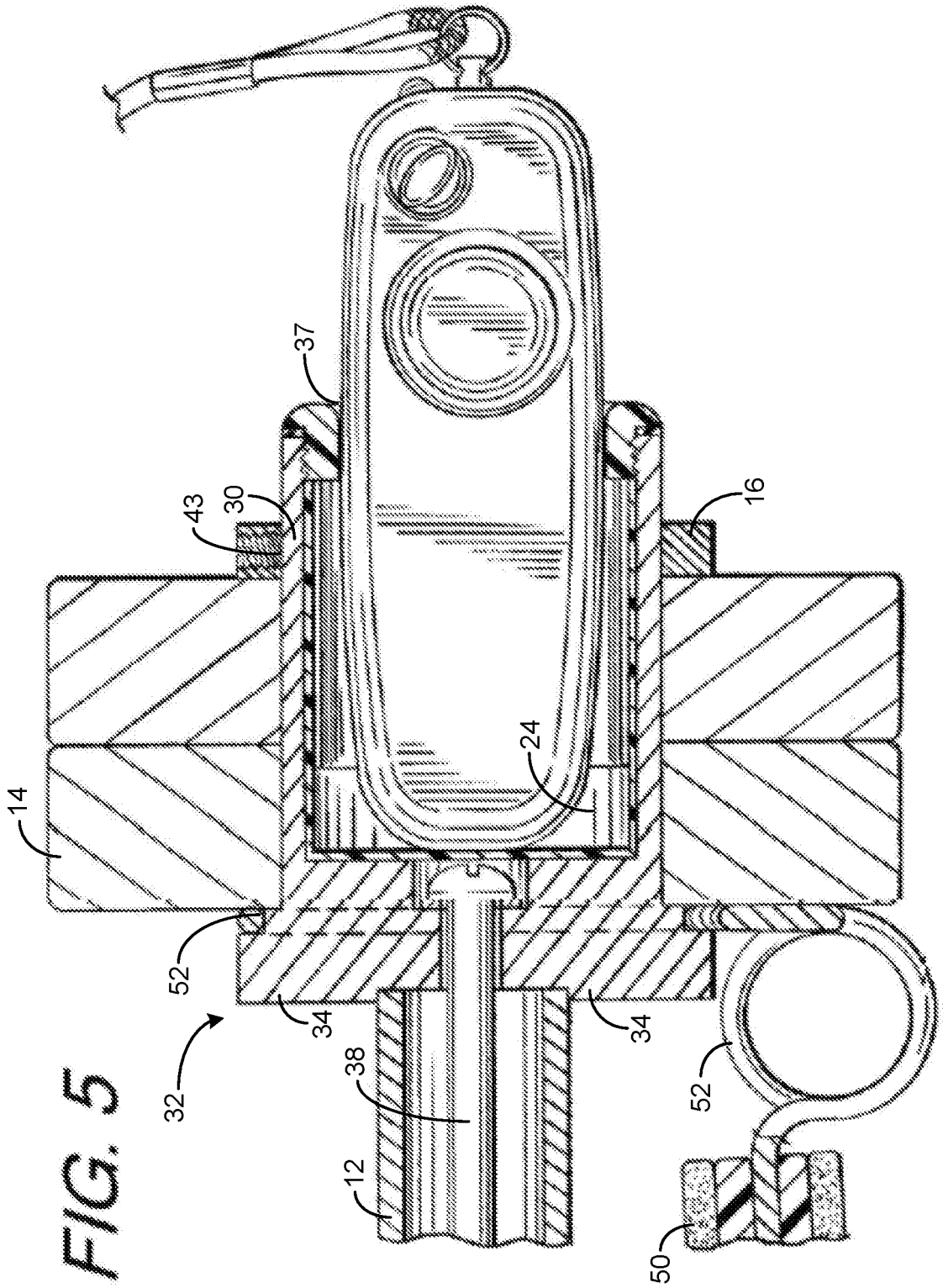

FIG. 5

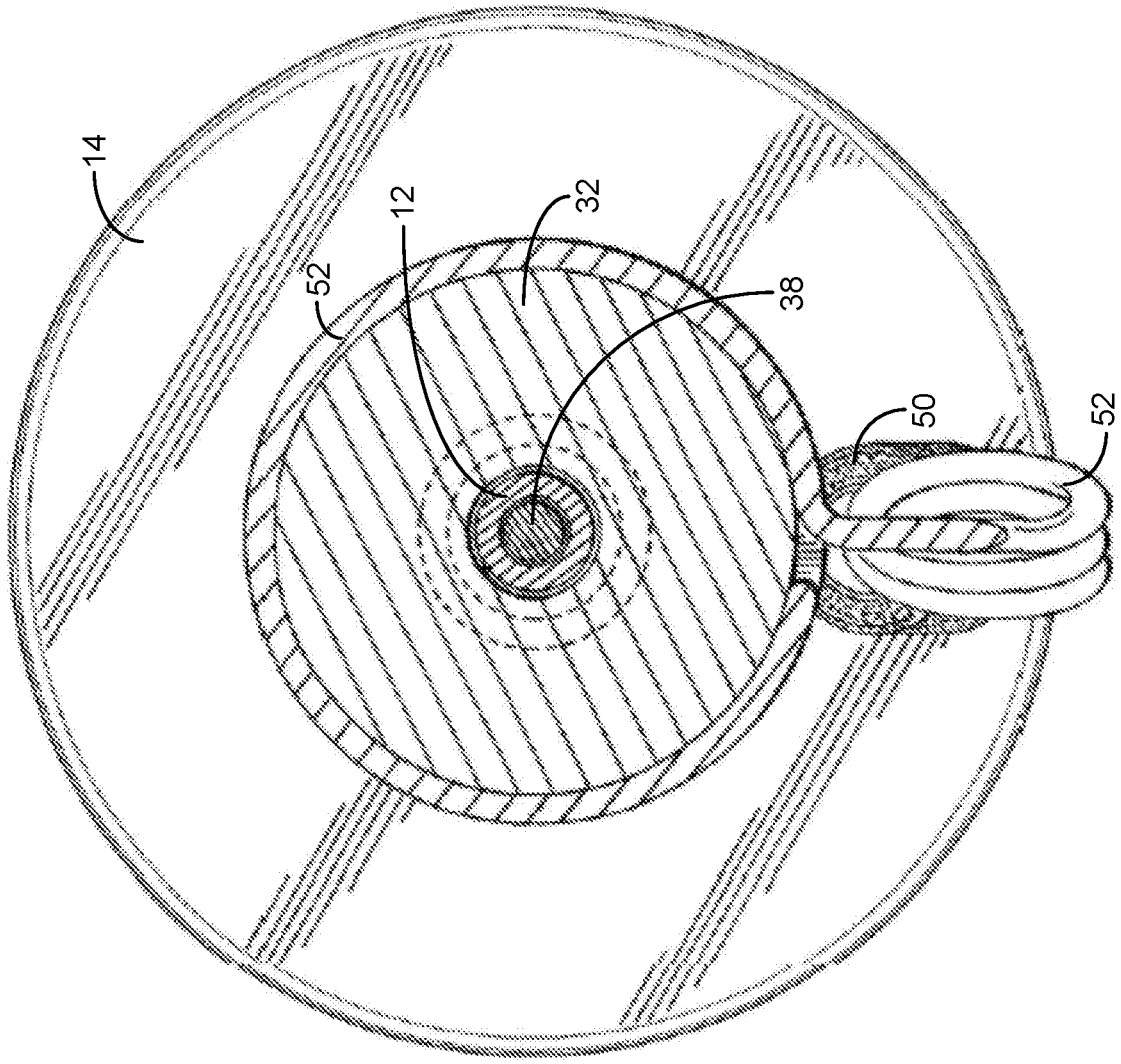

FIG. 6

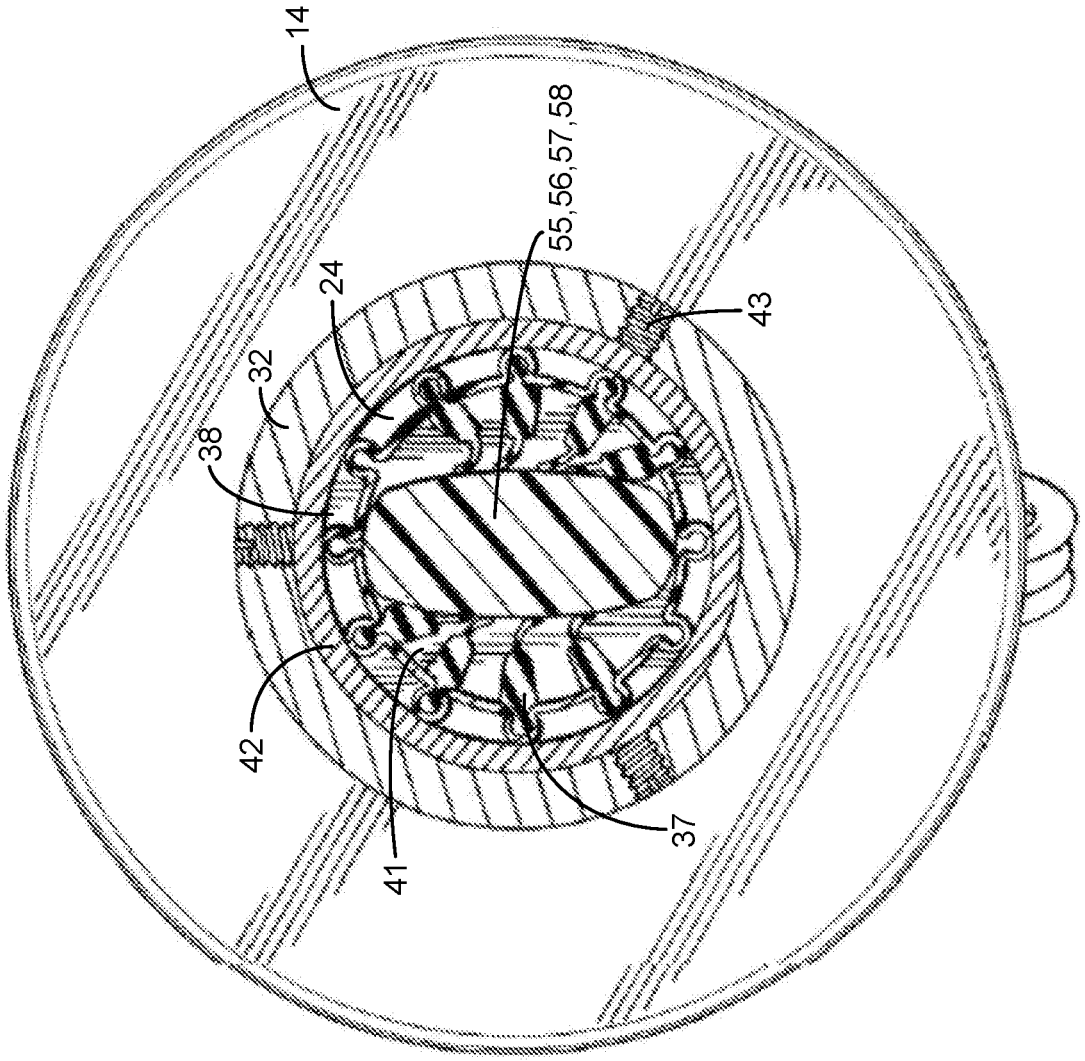

FIG. 7

DUMBBELL SAFETY, DEFENSIVE AND ALERTING ASSEMBLY

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present invention is a continuation of U.S. patent application Ser. No. 16/376,807 filed Apr. 5, 2019, the contents of which are incorporated herein by reference and made a part hereof.

FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] N/A

FIELD OF THE INVENTION

[0003] The present invention provides a dumbbell and grip exerciser with built in safety features such as a light assembly, an alarm generator, an electrified defensive device and/or a pressurized defensive device.

BACKGROUND OF THE INVENTION

[0004] Walking, running and weight lifting are common modes of exercise. Many people choose to enhance their walking or running workouts by adding weights to the workout. Ankle weights, weighted vests and jackets are commonly used by exercisers to enhance their workouts. Exercisers also commonly carry a dumbbell or a pair of dumbbells and do arm curls and other exercises while walking or running. Walking and running can present a risk of injury or death, especially when done outdoors, from numerous sources such as wheeled vehicles, tripping hazards, electrical hazards, water hazards, and threats from animals and humans, to name a few. Thus, there is a need to incorporate safety devices into a piece of exercise equipment to make exercise safer. A flashlight can help illuminate the pathway, and make the exerciser more visible to passing traffic and people. A sound generator can be used by an exerciser to signal a very loud alarm to summons help and to scare off attackers or potential attackers. An electrified defense (or defensive) unit (or device) with electrodes, e.g., stun gun, TASER, can be used in life threatening situations from human or animal attack to temporarily disable the attacker to allow a user to escape to safety. A defensive unit with pressurized fluid of a chemical that can be aimed and deployed against a menacing animal or human to cause discomfort and temporarily blind or disable the attacker to allow the exerciser to escape to safety.

[0005] U.S. Pat. No. 5,557,555 discloses a dumbbell with a flashlight, pepper spray, and weights but has no disclosure of a dumbbell with an alarm and a grip exerciser. U.S. Pat. No. 5,476,192 discloses a handweight with a spray device and an alarm but there is no disclosure of a flashlight or a grip exerciser. U.S. Pat. No. 5,549,220 discloses a device with a flashlight, siren, and sprayer but there is no disclosure of a grip exerciser or a dumbbell. U.S. Pat. No. 5,243,349 discloses a dumbbell with an audible alarm and a defensive spray but fails to disclose a flashlight or a grip exerciser. U.S. Pat. Nos. 7,509,955; 5,683,168; 5,941,629; and 3,638,836 disclose a flashlight with a pepper spray canister but there is no disclosure of a dumbbell, an alarm, and grip exerciser. U.S. Pat. No. 5,795,054 discloses a flashlight in combination with either a pepper spray or a sonic alarm but not both. U.S. Pat. No. 5,556,003 discloses a hand-held device of a pepper spray canister, flashlight, and siren, but no disclosure of a dumbbell or grip exerciser. U.S. Pat. No. 5,087,032 discloses a dumbbell and a grip exerciser but does not disclose an alarm, a flashlight or a pepper spray canister. U.S. Pat. No. 5,086,377 discloses a device having an alarm, a flashlight, and a pepper spray unit, but there is no disclosure of a dumbbell or a grip unit. U.S. Pat. No. 6,132,345 discloses a dumbbell and a flashlight but there is no disclosure of a grip exerciser, pepper spray canister or an alarm.

SUMMARY OF THE INVENTION

[0006] The present invention provides an exercise device having a bar with a first handle, a grip exerciser having a second handle connected to the bar via a resistance member proximate the first handle and moveable between a first position and a second position by a hand of a user. An auxiliary device is connected to the bar and is selected from a light assembly, a sound generator, an electrified defensive unit, a pressurized defensive unit, and combinations of the same.

[0007] The present invention further provides an exercise device having a bar with a first handle, a grip exerciser having a second handle connected to the bar via a resistance member proximate the first handle and moveable between a first position and a second position by a hand of a user. An electrified defensive unit is attached to one end of the bar and a pressurized defensive unit is attached to an opposite end of the bar.

[0008] The present invention further provides an exercise device having a bar with a first handle, a grip exerciser having a second handle connected to the bar via a resistance member proximate the first handle and moveable between a first position and a second position by a hand of a user. A light assembly is attached to one end of the bar and a sound generator is attached to an opposite end of the bar.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] To understand the present invention, it will now be described by way of example, with reference to the accompanying drawings and attachments in which:

[0010] FIG. **1** is a perspective view of a dumbbell of the present invention in use by a user.

[0011] FIG. **2** is a front elevation view of a dumbbell of the present invention.

[0012] FIG. **3** is an end view of a dumbbell of the present invention.

[0013] FIG. **4** is a front elevation view in cross-section taken along line **4-4** of FIG. **1**.

[0014] FIG. **5** is an enlarged view in cross section of a portion of the dumbbell of FIG. **1**.

[0015] FIG. **6** is a cross sectional view taken along line **6-6** of FIG. **4**.

[0016] FIG. **7** is a cross sectional view taken along line **7-7** of FIG. **4**.

DETAILED DESCRIPTION

[0017] While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and will herein be described in detail preferred embodiments of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiments illustrated.

[0018] FIG. **1** shows a dumbbell safety, defensive, and alerting assembly or device **10** having an elongate cylindrical bar **12**, weight plates **14**, locking collars **16**, a grip exerciser **18**, a first end chamber **22**, a second end chamber **24** opposed to the first end chamber **22**, and an auxiliary device **26** positioned in both of the end chambers **22**,**24**. The bar **12** is typically made of metal and has an axis of rotation **26**, an outer diameter, an outer surface **28**, a central gripping area **29**, and weight receiving portions **30** on opposed ends. The bar typically weighs from 1 to 15 pounds. The outer surface **28** in the central gripping area **29** can have a surface treatment to enhance gripping such as a knurling pattern, a pattern of protuberances, a pattern of indents, embossed lines, and raised ribs to name a few.

[0019] The gripping area **29** is positioned between two cylindrical sleeves **32** mounted to the bar. The cylindrical sleeves **32** have a greater outer diameter than the bar and an outer surface of the sleeves serve as the weight receiving portions **30**. A flange **34** extends from a proximal end of the sleeve **32** and serves as an inner most position for a weight plate **14**. It also provides a stop surface upon which the weight plates **14** are pressed against by the locking collars **16** to secure the weights for use, as is well known in the art.

[0020] The cylindrical sleeves **32** define the end chambers **22**, **24** that house the auxiliary devices **26** and include a retaining member **35**, and a threaded cap **39**. In one preferred form of the invention, the retaining member **35** is dimensioned to form an interference fit with an outer surface **36** of the auxiliary device **26**. Preferably, the auxiliary device **26** is centrally disposed within the chamber **22**,**24**.

[0021] In one embodiment, the retaining member **35** has a ring **41** supporting plurality of radially directed, spokes or ribs **37**, circumferentially spaced from one another about an inner surface **38** of the cylindrical sleeve. The ring **41** can be disposed in an annular wall **42** to form a ring retaining assembly. The ring retaining assembly can be centrally disposed in the chamber **22**,**24** and held in place by the threaded cap **39**. The spokes or ribs **37** can be flexible or rigid.

[0022] In another embodiment, the retaining member **35** can be a foam rubber insert, padding, dunnage, hook-and-loop fasteners, fabric or other material to fill any space between the outer surface of the auxiliary device **26** and the inner surface **38**. Fasteners, brackets, clips and other retaining devices could also be used.

[0023] The threaded cap **39** has a central opening **40** into the chambers **22**,**24**. The opening **40** can be dimensioned to engage the outer surface **36** of the auxiliary device **26** to support and retain the auxiliary device **26**. The cylindrical sleeves **32** can be fixedly attached to the bar or can be rotatably attached to the bar. Suitable methods of fixedly attaching include welding, brazing, soldering, by fasteners **38** (FIG. **5**), and by adhesives. A bolt and nut **38** is shown as one preferred methodology for connecting the sleeves to opposed ends of the bar **12**. The bar **12** is shown being generally hollow and defining an inner lumen **47** through which the bolt passes an entire length dimension of the bar **12**. Suitable methods of rotatably attaching include using bearing assemblies such as ball bearings, taper bearings and the like.

[0024] Weight plates **14** are positioned in the weight receiving portions **30** and are held in place by the locking collars **16** and set screws **43**. Each of the weight plates **14** has a central hole through the thickness of the plate and is dimensioned to be larger than the outer diameter of the sleeves to allow for sliding engagement with the bar **12**. The difference in diameters should be small so that the weight plates **14** do not move radially causing them to rattle or vibrate against the sleeves **32** and the bar **12** and each other.

[0025] The locking collars **16** can also be of a coiled spring type connector or a clip type collar that can be releasably attached to the bar. It is also contemplated that the locking collars **16** are permanently attached to the bar such as by welding, soldering, brazing, adhesive bonding, connecting using fasteners, or other processes well known to those of ordinary skill in the art.

[0026] The grip exerciser **18** includes a handle **50** and a resistance member **52** that connects the handle to the bar. In one form of the invention, the resistance member **52** is a spring such as a coiled spring **53**, for example.

[0027] Suitable auxiliary devices **26** can include a light assembly **55**, an alarm or alerting assembly **56**, an electrified defense device **57**, a pressurized defense device **58**. The auxiliary devices **26** can be used in any combination. The light assembly **55**, in one embodiment, functions as a flashlight. The light assembly can also provide light at a constant illumination or it can flash the light in repeated sequences such as a strobe light. It is also contemplated that the light assembly **55** can include numerous light sources spaced from one another and can be lit in a desired or random sequence. The light assembly can also include one light source that is operated like a flashlight with a constant illumination and a second light source that flashes. Additional light sources can be added without departing from the present invention. Suitable light sources include incandescent bulbs, halogen bulbs, fluorescent bulbs, and LEDs. More preferably the light source is powered by direct current (DC) in a voltage range of from 1.5 volts to 24 volts for example.

[0028] The alarm or alerting assembly **56** is a sound generator having a sound emitter and a second switch **59** moveable from an on position to an off position. In one example alarm assembly **56**, the second switch **59** is a dead-man switch. A dead-man switch **59** has a piece of connecting material such as a lanyard, rope, string, strap **61** that connects a portion of the user, such as the user's wrist **63**, to the dead-man switch **59** on the alerting assembly **56**. If the dumbbell is dropped, the dead-man switch **59** is triggered and the alarm sounds. When the second switch is in the on position an audible sound is emitted from a sound emitter **66**. The sound emitter is meant to draw attention using a high volume noise. The noise can take on a variety of sounds including a constant tone of a single pitch, a repeated tone with a variation in volume, a sequence of tones of various pitches, a klaxon horn, a siren, an alarm, prerecorded spoken words requesting help, among other sounds that can be used to attract attention. Like the light assembly, the sound generator can have a housing that encloses the sound emitter and a second fitment for releasably or permanently attaching to the dumbbell in the same fashion as the light assembly.

[0029] The electrified defensive device **57** has a positive electrode, a negative electrode, a source of current, and an electrical connection connecting these parts. Suitable electrified defensive devices **57** include a stun gun, and a TASER.

[0030] The pressurized defensive device **58** has a tank containing a defensive fluid under pressure. The defensive

device also has an outlet, a valve at the outlet, and a trigger connected to the valve for moving the valve from a closed position to an open position. When in the open position, defensive fluid is released under pressure through the outlet and can be aimed at a desired target. Suitable defensive fluids include pepper spray (i.e., *capsicum* spray), tear gas, combinations of pepper spray and tear gas, and other chemicals and sprays likely to cause discomfort and pain to an intended target. Other effective chemical deterrents can be used that are well known to those of ordinary skill in the art.

[0031] Suitable batteries can include rechargeable and non-rechargeable batteries. Suitable batteries can include lead acid, alkaline, nickel cadmium, nickel metal halide, silver oxide, lithium ion, and others known to those of skill in the art. Batteries come in various sizes including AAAA, AAA, AA, B, C, D, PP3 (9V), CR123A, CR2, coin-shaped cells, camera batteries, round button cells, shaped batteries, and other sources of DC current known to those of ordinary skill in the art.

[0032] Suitable switches include any type of electrical type switch including a single pole, single throw; single pole, double throw; double pole, double throw; tactile switch; dead-man switch; momentary switch, contactless switch; safety switch; multiple position rotary switch; paddle switch, and other types of switches well known to those ordinary skill in the art. The switch can be moved from off to on in a variety of manners such as by sliding a member from one place to another, pressing a button, flipping a toggle, rotating a member, making a sound, making a gesture, for example. The switch can be part of a panel of switches for controlling other or all of the auxiliary units. The switches can also be a part of the auxiliary units.

[0033] It is also contemplated that the auxiliary units can be deployed using two separate dumbbell base units (bar **12** and grip exerciser **20**). One dumbbell can be equipped with any number of auxiliary units and the second dumbbell can have any number of auxiliary units. The auxiliary units of one dumbbell can be the same or different from the second dumbbell. In one embodiment, a first dumbbell base unit **12**,**20** has a light assembly **55** and a sound generator **56**, and the second dumbbell base unit **12**,**20** has an electrified defensive unit **57** and a pressurized defensive unit **58**. The first dumbbell assembly is a passive defensive device and the second dumbbell is an active defensive device.

[0034] Many modifications and variations of the present invention are possible in light of the above teachings. It is, therefore, to be understood within the scope of the appended claims the invention may be protected otherwise than as specifically described.

I claim:

1. An exercise device comprising:

a bar having a first end, a second end opposed to the first end, and a handle positioned between the first end and the second end, a first weight receiving portion having a first chamber is positioned proximate the first end and a second weight receiving portion having a second chamber is positioned proximate the second end;

a first auxiliary device is releasably positioned in the first chamber by a first retaining member, the first retaining member dimensioned to form an interference fit with an outer surface of the first auxiliary device;

a second auxiliary device is releasably positioned in the second chamber by a second retaining member, the second retaining member dimensioned to form an interference fit with an outer surface of the second auxiliary device; and,

the first auxiliary device and the second auxiliary device are selected from the group consisting of a light assembly, a sound generator, an electrified defensive unit, and a pressurized defensive unit.

2. The exercise device of claim **1** wherein the first retaining member comprises a generally cylindrical body having an annular wall proximate an inner surface of the first chamber and having a plurality of arms circumferentially spaced about the annular wall and extending radially inwardly.

3. The exercise device of claim **2** wherein the plurality of arms are flexible.

4. The exercise device of claim **2** wherein the plurality of arms are rigid.

5. The exercise device of claim **2** wherein the plurality of arms are equally circumferentially spaced.

6. The exercise device of claim **1** wherein the first chamber has a first diameter and the first retaining member has a central opening having a second diameter smaller than the first diameter.

7. The exercise device of claim **6** wherein the second chamber has a first diameter and the second retaining member has a central opening having a second diameter smaller than the first diameter.

8. The exercise device of claim **1** wherein the handle has an outer surface with a surface treatment to enhance gripping.

9. The exercise device of claim **8** wherein the surface treatment is selected from the group consisting of a knurling pattern, a pattern of protuberances, a pattern of indents, embossed lines, and raised ribs.

10. The exercise device of claim **1** further comprising a weight plate on the first weight receiving portion and the second weight receiving portion.

11. The exercise device of claim **1** wherein the first weight receiving portion and the second weight receiving portion comprises a cylindrical sleeve having a diameter greater than a diameter of the handle.

12. The exercise device of claim **10** further comprising a locking collar on the first weight receiving portion and the second weight receiving portion and abutting the weight plate.

13. The exercise device of claim **12** wherein the locking collar is a coiled spring type connector or a clip type collar.

14. A system for assembling an exercise device comprising:

a bar having a first end, a second end opposed to the first end, and a handle positioned between the first end and the second end, a first weight receiving portion having a first chamber positioned proximate the first end, and a second weight receiving portion having a second chamber positioned proximate the second end;

a plurality of retaining members, each of the plurality of retaining members having a generally cylindrical wall and a central opening, the generally cylindrical wall is dimensioned to be inserted into the first chamber or the second chamber and form an interference fit with an inner wall of the first chamber or the second chamber, and the central opening has an inner surface dimen-

sioned to contact an outer surface of an auxiliary device to retain the auxiliary device in the first chamber or the second chamber; and,

a plurality of auxiliary devices including at least two of a light assembly, a sound generator, an electrified defensive unit, and a pressurized defensive unit.

15. The system of claim **14** wherein the inner surface is dimensioned to releasably retain a retaining member of the plurality of retaining members.

16. The system of claim **14** further comprising a grip exerciser for attaching to the handle.

17. The system of claim **14** further comprising weight plates for attaching to the first weight receiving portion and the second weight receiving portion.

18. The system of claim **17** further comprising a locking collar for releasably retaining the weight plates on the first weight receiving portion and the second weight receiving portion.

19. The system of claim **14** wherein the handle has an outer surface with a surface treatment to enhance gripping.

20. The system of claim **19** wherein the surface treatment is selected from the group consisting of a knurling pattern, a pattern of protuberances, a pattern of indents, embossed lines, and raised ribs.

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