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(54) **AIMING DEVICE AND METHOD FOR ARCHERY BOW**

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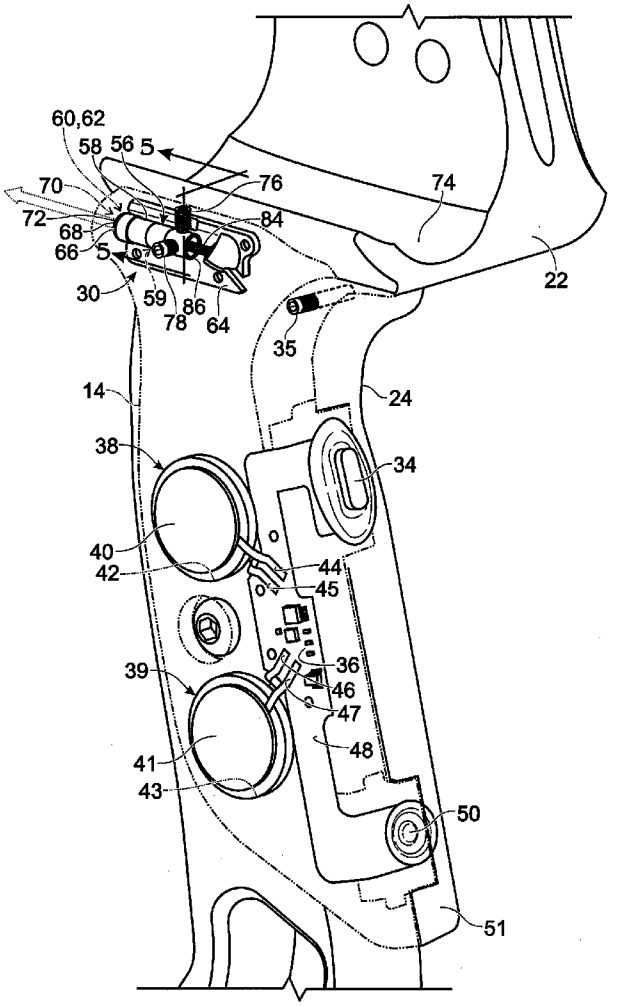
(57) **ABSTRACT**

An apparatus for improving an archer's aiming consistency by utilizing a directed light beam device mounted to an archery bow or integrated into the grip of an archery bow. Various embodiments provide an apparatus comprising a directed beam light source such as a laser, a power source for providing power to said light source, an actuation switch for allowing power to flow from said power source to said light source, a circuit for interconnecting said light source, said power source, and said actuation switch, and a jacket adapted to be attached to an archery bow within which said light source, said power source, said actuation switch, and said circuit are disposed, so that, when said jacket is attached to the archery bow said light source directs light forwardly from said bow toward a target and so that, during use, said actuation switch can be actuated by the same hand that is holding the bow in response to the natural motion of drawing the bow string. The jacket may fit over and around the stock grip of a bow and be shaped to comfortably fit the hand of an archer. Alternatively, the jacket may replace the stock grip normally provided with the bow.



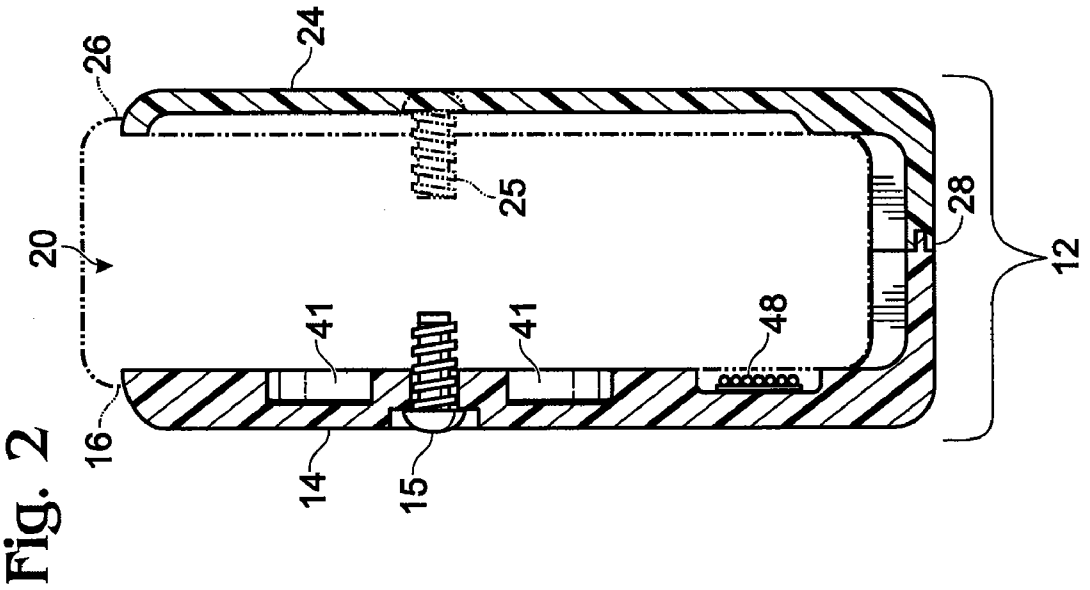

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Fig. 2

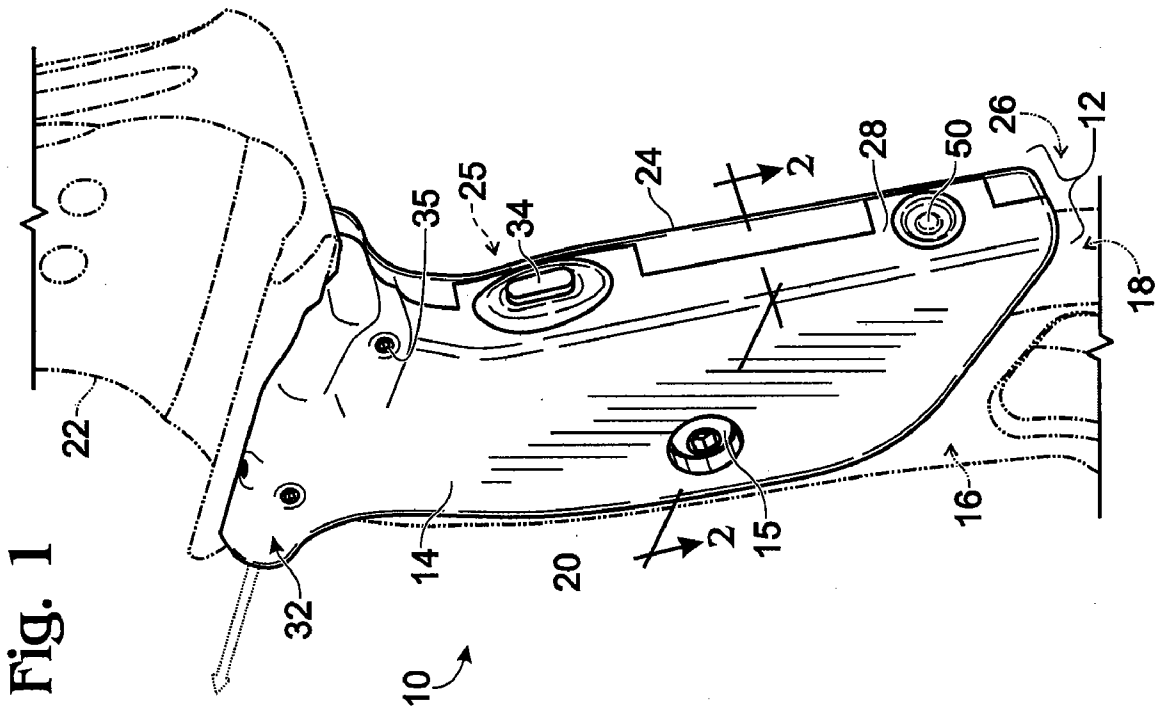
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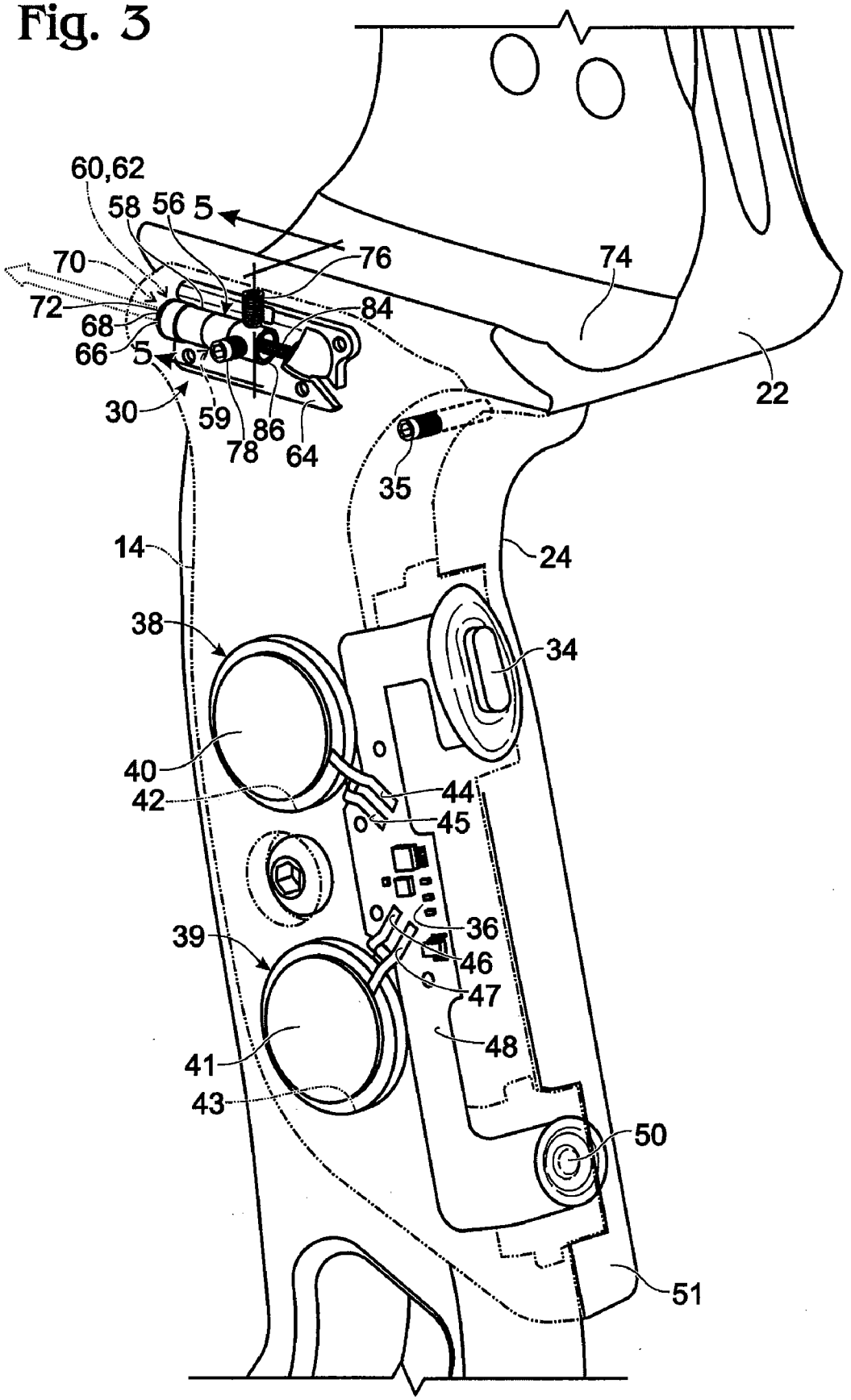
Fig. 1

Fig. 3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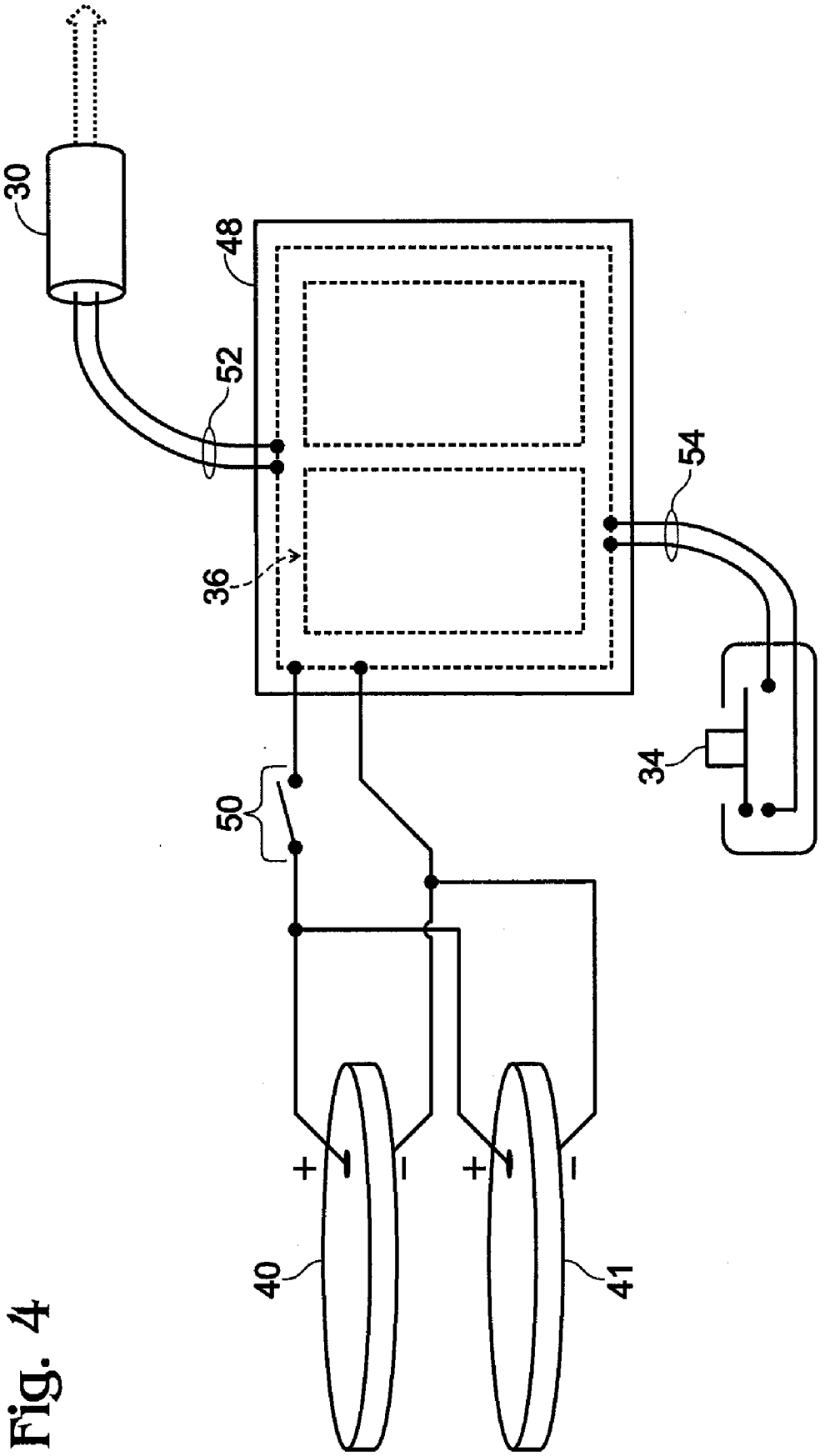

Fig. 4

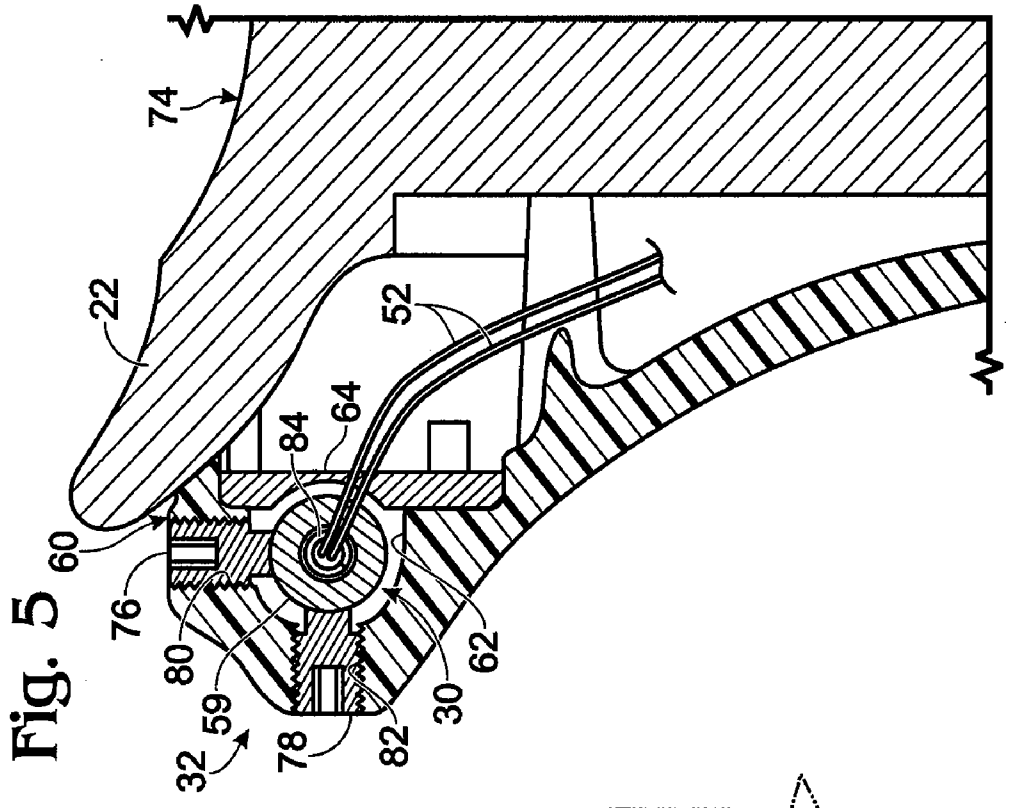

Fig. 5

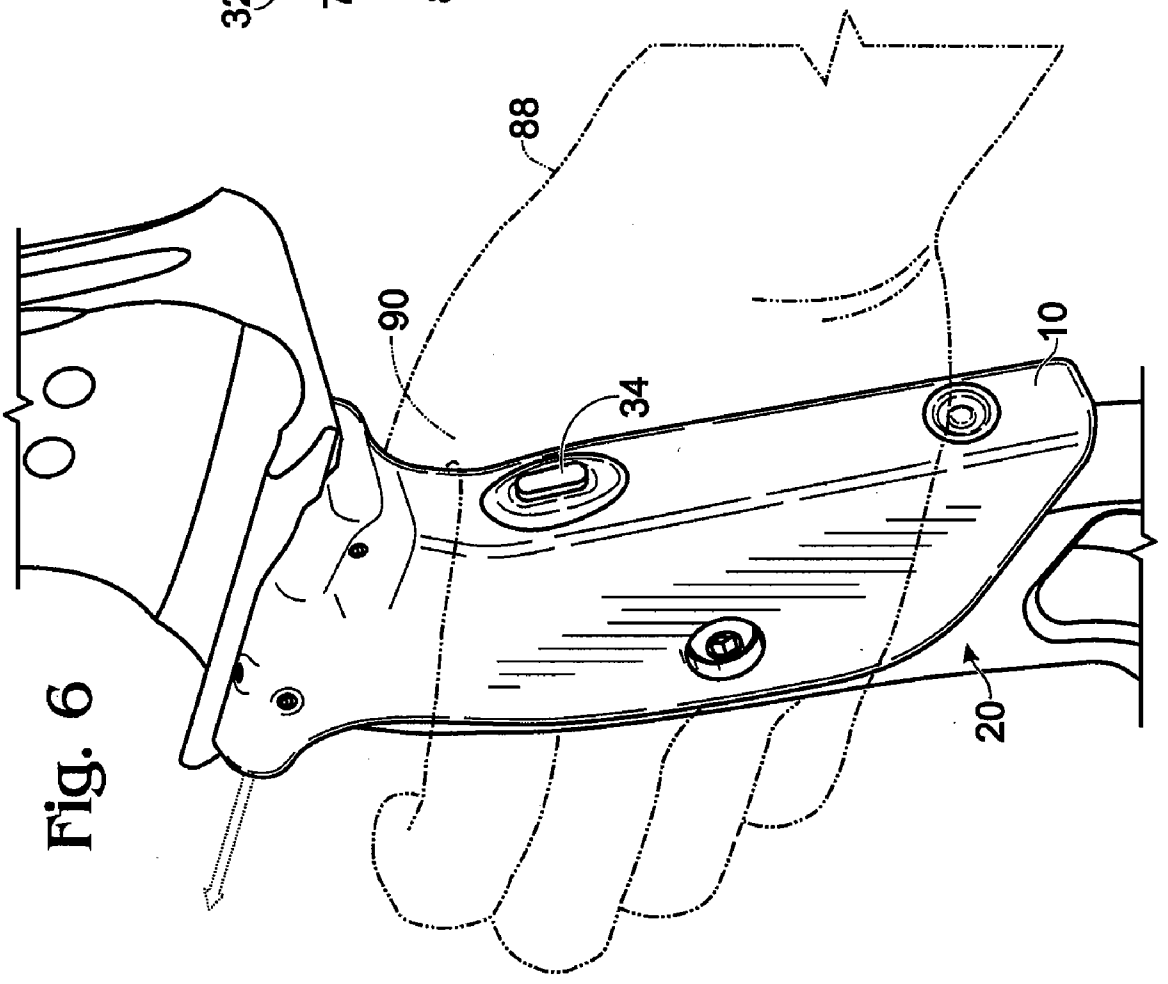

Fig. 6

AIMING DEVICE AND METHOD FOR ARCHERY BOW

FIELD OF THE INVENTION

[0001] This invention relates to aiming devices for weapons, particularly directed light beam aiming devices for archery bows that illuminate a target at the spot where an arrow is to strike the target, and which may be used to indicate to the archer whether the bow is being held in the proper alignment for accurate aiming.

BACKGROUND OF THE INVENTION

[0002] All publications referred to herein are incorporated by reference in their entirety to the same extent as if each individual publication or patent application was specifically and individually indicated to be incorporated by reference. The following description includes information that may be useful in understanding the present invention. It is not an admission that any of the information provided herein is prior art or relevant to the presently claimed invention, or that any publication specifically or implicitly referenced is prior art.

[0003] In aiming an archery bow there are three adjustments of the position of the bow that must be considered: elevation, windage and rotation. The elevation of the arrow must be such that when it is released the arcuate trajectory that it will follow will terminate at the desired point on the target. As to windage, the lateral direction that the arrow is pointed must be directed toward the same point on the target. In addition, if the bow is not held in a vertical orientation, or if the bow rotates even slightly in the archer's hand, then the elevation and windage adjustments will not be correct if they are made on the assumption that the bow is vertically oriented. Even slight variations in elevation, windage, and rotation can dramatically affect aiming consistency.

[0004] There are various kinds of bow sights for archery, but perhaps the most common includes an aperture mounted to the bow through which the archer looks at the target when the bow string is drawn back. In modern equipment, the bow-mounted aperture often includes several horizontal pins which are for use at different respective ranges (range being the distance from the archer to the target). These devices are commonly called pin sights. If the aperture is the right distance above the arrow rest for the range to the target, if the correct pin is used for sighting, and if the string is consistently drawn back to the same position in relation to the bow and the eye of the user, this type of sight works well when the bow is vertically oriented. In bows that are not sued for competition, this type of sight can be improved by providing a second aperture attached to the bow string itself to aid in positioning the user's eye.

[0005] However, it is often the case that when the bow string is drawn back, the hand of the user gripping the bow exerts torque on the bow, causing it to rotate. When the bow rotates so that it is not vertically oriented and all else remains the same, the arrow will move to the left or right of the target and up or down, typically missing the aiming point on the target. Yet, it will seem to the user that the bow has been properly sighted because the point on the target is in the aperture of the pin sight, and the second aperture attached to the string, where used. Such rotation makes it difficult for the archer to maintain consistent shooting accuracy.

[0006] It has been observed that the sighting problem resulting from pre-release bow rotation can be diagnosed and alleviated by the use of a laser aiming device that illuminates a point on the target with a laser beam from a laser mounted on the bow. If the user exerts torque on the bow, the bow rotates around an axis approximately coincident with the arm holding the bow. The archer will naturally compensate by moving to realign the aperture sight onto the target, but because the bow has rotated, the laser dot will have moved off the point of aim viewed through the aperture sight. However, when using a laser device as a training aid, consistent aim for a given range can be maintained by moving the bow so that the aiming point viewed through the aperture sight is coincident with the illuminated dot created by the laser.

[0007] The illuminated laser dot is only coincident with the impact point of the arrow at the single given range, due to the offset of the laser source and the arcuate trajectory of the arrow. For all other ranges, the illuminated dot will be either above or below the impact point. However, the closer the laser beam source is to the axis of rotation, the less offset there will be between the arrow impact point and the illuminated dot on the target at ranges other than the calibration range. For short ranges, where the arrow trajectory is close to flat, a laser source located near the arrow shelf will place a dot on the target that is very close to the actual impact point of the arrow. Additionally, a laser dot provides a physical aiming point on the target, so the archer can compensate for changes in range by aiming so as to hold the dot an appropriate distance above or below the desired impact point.

[0008] Various types of laser aiming devices for archery bows are known. For example, Huang et al., U.S. Pat. No. 5,495,675 describes a semiconductor laser attached to a bow by a mounting base and three x-, y- and z-axis holder frames. A separate on-off switch is connected to the module by a wire and is provided with an adhesive tape to mount the switch somewhere on the bow. Hodge et al., International Patent Publication No. WO2004/094934 describes a laser attached to a bow by a mounting bracket, the laser having a pull switch that activates the laser in response to drawing the bow.

[0009] Laser aiming devices for handguns and rifles are also known. For example, Toole U.S. Pat. No. 5,179,235; Toole et al. U.S. Pat. No. 5,435,091; Toole et al. U.S. Pat. No. 5,706,600; Danielson et al. U.S. Pat. No. 6,526,688; and Danielson U.S. Pat. No. 7,260,910, each disclose various embodiments of laser aiming devices adapted for use with a handgun. However, they do not address the particular challenges that arise in the use of a bow, which is a much different weapon from a handgun.

[0010] Unfortunately, known laser aiming devices leave significant problems unsolved, such as minimizing the effects of the aiming device on bow balance, minimizing the effects that bow rotation has on the laser point location at the target, and actuating the laser when needed without interfering with the normal bow and string movements of the archer. Since these prior devices place the laser source at some distance from the arrow shelf, the dot-to-impact-point offset due to changes in range is relatively large, and the laser systems disclosed cannot be made coincident with the arrow's path at short ranges. Additionally, the previously-known laser aiming devices for bows are bulky and poorly integrated with the structure of the bow, making the devices prone to being knocked out of alignment or damaged during both storage and field use. If the device must be removed for storage or transport, then each remount creates another opportunity for the device to become out of alignment. Also, when hunting, equipment that tends to snag or catch on vegetation creates

noise and makes moving stealthily more difficult; and furthermore, equipment for hunting use must be silent in operation. It is a particular drawback of these previously known devices that they are awkward to actuate on a shot-to-shot basis so that either they must be left on or they tend to affect the aim of the archer.

[0011] Therefore, there is a need in the art for a compact sighting system for archery bows in which the directed beam light source, the power source, the driving circuit, and actuation switch are substantially integrated into the existing dimensions of an archery bow's grip, such that the arrangement creates a robust, stable, unobtrusive system that is less susceptible to damage, can remain in place during storage and transport, allows for minimal offset between the illuminated dot and the arrow impact point, and may be actuated with minimal effect on the aim of the archer.

SUMMARY OF THE INVENTION

[0012] The present invention includes an apparatus for improving an archer's aiming consistency by utilizing a directed light beam device mounted to an archery bow or integrated to the grip of an archery bow.

[0013] Various embodiments provide for an apparatus comprising a directed beam light source, a power source for providing power to said directed beam light source, an actuation switch for allowing power to flow from said power source to said light source, a circuit for interconnecting said light source, said power source, and said actuation switch, and a jacket adapted to be attached to an archery bow within which said light source, said power source, said actuation switch, and said circuit are disposed, so that, when said jacket is attached to the archery bow said light source directs light forwardly from said bow toward a target and so that during use, said actuation switch can be actuated by the same hand that is holding the bow in response to the natural motion of drawing the bow string.

[0014] In one embodiment, the jacket fits over and around the grip of a bow and is shaped to comfortably fit the hand of an archer. However, the jacket may instead replace the factory grip normally provided with the bow.

[0015] As used in the specification, claims and abstract hereof, the term "jacket" is intended to encompass both of these possibilities. The actuation switch is located on the back side of the jacket and is thus naturally activated by pressure from the archer's hand as the bow is drawn. Releasing the arrow, or returning the bow to the ready position, deactivates the directed beam source.

[0016] In another embodiment, the directed beam light source comprises a laser. The laser may be disposed near the upper area of the jacket, on the same side of the jacket as the archer's fingers, and may further be disposed in a spring-loaded, adjustable mounting such that the direction of the laser beam can be adjusted for both windage and elevation. The laser is preferably located on the side of the grip opposite the fingers, but may be located in front of the fingers or on the arrow shelf without departing from the principles of the invention.

[0017] Other features and advantages of the invention will become apparent from the following detailed description, taken in conjunction with the accompanying drawings which illustrate, by way of example, various features of embodiments of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0018] FIG. **1** is a perspective of a preferred embodiment of an aiming device for an archery bow according to the present invention, attached to an archery bow shown in phantom.

[0019] FIG. **2** is a cross section of the aiming device of FIG. **1**, taken along line **2-2** thereof, attached to the archery bow in phantom.

[0020] FIG. **3** is a perspective of the aiming device of FIG. **1**, showing the archery bow, the interior components of the aiming device and, in phantom, the left side of the device.

[0021] FIG. **4** is a schematic of a representative electrical circuit for the aiming device of FIG. **1**.

[0022] FIG. **5** is a cross section of the aiming device of FIG. **1**, taken along line **5-5** thereof.

[0023] FIG. **6** is a perspective of the aiming device of FIG. **1**, attached to the archery bow and gripped by the left hand of an archer, shown in phantom.

DETAILED DESCRIPTION OF EMBODIMENTS OF THE INVENTION

[0024] Unless defined otherwise, technical and scientific terms used herein have the same meaning as commonly understood by a person having ordinary skill in the art to which this invention belongs.

[0025] One skilled in the art will recognize many methods and materials similar or equivalent to those described herein, which could be used in the practice of the present invention. The present invention is not intended to be limited to the specific methods and materials described herein.

[0026] An aiming device according to the present invention comprises a grip jacket that fits on the grip of an archery bow and that includes a directed energy source, preferably a laser, a power source for the directed energy source, and at least one switch that actuates the energy source in response to pressure on the back of the jacket, which naturally occurs when the bow string is drawn. However, one or more switches could be mounted in locations other than the back of the grip without departing from the principles of the invention. It is to be understood that, for the purpose of the specification, claims, drawings and abstract hereof, the term "light" shall broadly mean electromagnetic energy whether in the visible spectrum or not.

[0027] More specifically, a preferred embodiment of an aiming device **10** according to the invention shown in FIGS. **1** and **2**, comprises jacket **12**, having two parts. A first part **14** fits on and wraps around a first side **16** and the back **18** of the grip **20** of an archery bow **22**, and a second part **24** fits on the second side **26** of the grip **20** and attaches along a back edge **28** to the first part **14**. A laser module is disposed in the first part **14** of the jacket at the top **32** thereof adjacent the first side **16** of the grip **20**. An actuation switch **34** is disposed in the first part **14** of the jacket at the top thereof adjacent the back **18** of the grip.

[0028] Although the laser aiming device described and claimed herein is called a "jacket" to emphasize that it may be placed over the stock grip of the bow itself, the scope of the claims is not intended to be limited thereby. It is to be recognized that others might refer to a laser aiming device according to the present invention itself as a "grip," and that the use of such terminology would not take such a device outside the scope of the claims. Thus, the terms "jacket" and "grip" may be used interchangeably with reference to actual products, without departing from the principles of the invention.

[0029] While it is easier to manufacture the jacket in two parts, it is to be recognized that the jacket could be a single part without departing from the principles of the invention. It can be seen in FIG. **2** that when both halves of the jacket **12** are mounted in place, jacket **12** is generally C-shaped in cross

section and wraps around the bow grip **20**. The first part **14** of the jacket is attached to the bow grip **20** by screw **15** and the second part **24** of the jacket is attached to the bow grip by screw **25**. Screw **35** attaches first part **14** to second part **24** directly without extending through the bow grip **20**. The screws are located so as to avoid the internal components while providing a robust, tight connection between jacket **12** and the bow grip **20**.

[0030] Turning to FIG. **3**, the preferred embodiment of the aiming device also includes a laser drive circuit **36** and two battery holders **38**, **39** for holding batteries **40**, **41** that power the laser drive circuit. For the purpose of the specification, drawings, claims and abstract, the battery holders **38**, **39** are each referred to herein as a "power source," with or without the battery installed, the term "power source" being intended to encompass any appropriate source, or provision for, providing power to the directed beam light source. Preferably, the battery holder is adapted to receive a thin-profile Cr2032 cell, or equivalent, which permits the jacket to be relatively thin. The battery holders **38**, **39** comprises cavities **42**, **43** formed in the first part **14** of the jacket, and pairs of positive and negative battery contacts **44**, **45** and **46**, **47** respectively, connected to a circuit board **48** that also supports the laser drive circuit **36**. The laser drive circuit **36** includes one or more standard integrated circuit components used to drive a diode laser, as will be readily understood by a person having ordinary skill in the art.

[0031] Preferably, the device includes a power switch **50**, as well as the actuation switch **34**. The power switch is for allowing power to flow from the battery to the drive circuit, or not. This allows the archer to disable the aiming device, for example during transport or storage, or simply to preserve battery energy when the bow is in use but the sighting system is not needed. Preferably, the power switch **50** is disposed in the first part **14** of the jacket at the bottom **51** thereof adjacent the back **18** of the bow grip **20**. However, it is to be recognized that the power switch may be placed elsewhere, or eliminated entirely, without departing from the principles of the invention. Preferably, the power switch is a push button switch that closes or opens a circuit each time it is pushed. However, it is to be recognized that other types of switches could be used as a power switch without departing from the principles of the invention.

[0032] The laser module **30** comprises a diode laser **56** and a lens **58** mounted in a tubular enclosure **56**, as shown (cutaway) in FIG. **3**. To accommodate the laser module, the jacket **12** includes an outwardly-directed laser housing **60**, having a laser module receiving chamber **62** formed therein. With the laser module **30** placed therein, the chamber is closed by a cover plate **64**. The front end of the tubular enclosure is rounded, preferably forming a hemisphere, to form a convex laser module bearing **66**, and a corresponding concave bearing surface **68** is formed in the front **70** of the receiving chamber **62** to receive the bearing **66**. As described more fully below, this structure enables the laser module to be adjusted in two dimensions for elevation and windage calibration. The bearing **66** includes a front window **72** formed therein for laser light to pass through the module, the lens **58** being disposed between the window **72** and the diode laser **56** at a position to essentially collimate the light emitted by the diode laser and direct that light forwardly toward a target, as will be readily understood by a person having ordinary skill in the art. It is to be understood that the window **72** may be covered by transparent material or may simply be an opening.

[0033] A significant feature of the preferred embodiment of an aiming device according to the present invention is that the laser module is disposed near the top of the device adjacent the arrow shelf **74** of the bow **22**. This location results in the laser light beam emanating from a point in close proximity to the arrow's point of departure and to the bow's axis of rotation, thus maintaining more accurate aim over a wider variation in target distances.

[0034] FIG. **4** shows a schematic of a representative electrical circuit for the aiming device. The laser module **30** is connected by wires **52** to the circuit board **48**. The actuation switch **34** is connected by wires **54** to the drive circuit **36**. The batteries **40**, **41** are also connected to the drive circuit **36**. Power switch **50** is connected to the drive circuit **36**, in series with the batteries **40**, **41**. Finally, the actuation switch **34** is connected to the drive circuit **36** to actuate the laser where the switch is pushed. It is to be recognized that the actuation switch may be located or configured differently on the jacket, and that additional actuation switches may be added without departing from the principles of the invention.

[0035] As shown in FIGS. **3** and **5**, an elevation adjustment screw **76** and a windage adjustment screw **78** are threaded into respective orthogonally-aligned apertures **80** and **82** of the chamber **62**. A spring **84** exerts force on the back **86** of the laser module to press and hold the bearing **66** against the bearing surface **68** and to hold the tubular enclosure **59** against the adjustment screws **76**, **78**. Consequently, when those screws are either advanced or withdrawn they cause the laser module to rotate about the bearing **66**, which changes the direction that the laser light propagates.

[0036] The aiming device is adjusted initially at the time it is mounted on the bow to account for alignment variations in the components and to range the device. This calibration process is completed at a known distance so as to ensure that when the light illuminates a target at that distance, the arrow will strike the target at the spot produced by the light if the bow string is properly drawn and released.

[0037] It is another important aspect of this invention that, because of the integrated chamber for the laser module, the laser module's close proximity to the bow structure, and the laser module's robust mounting arrangement, it is not likely to be bumped, snagged, or jarred during use, and it does not need to be demounted for storage or transport. Therefore, the laser device can be relied upon to remain calibrated through multiple outings.

[0038] While it is contemplated that the preferred embodiment will employ a diode laser as a source of visible red light, it should be appreciated that other types of directed light beams might also be used without departing from the principles of the invention. For example, it is also contemplated that an infrared laser could be used together with goggles worn by the archer that produce visible light in response to stimulation by infrared light. Similarly, a green or other color visible laser may be used. And, in some cases, such as nighttime training exercises, an intense incoherent light source might also be used. Accordingly, for the purpose of the specification, claims, drawings and abstract, "directed beam" shall mean a beam of energy that is substantially collimated from a source thereof to a target that is within a useful range of an archery bow, and includes without limitation a substantially collimated Gaussian light beam produced by a laser.

[0039] Turning to FIG. **6**, which shows an archer's hand **88** (in phantom) gripping the aiming device **10** mounted on the bow grip **20**, the actuation switch **34** is preferably disposed

approximately where the web **90** between the user's thumb and forefinger lies. Ordinarily, an archer is advised to maintain a relaxed grip on the bow so that the bow rests on the hand without being squeezed. However, when the string is drawn by the archer, the grip will push back into the archer's hand. Because of this reaction, the actuation switch is pushed in by the web of the user's hand, thereby turning on the laser. Thus, an important feature of the aiming device is that the laser ordinarily is not turned on so much intentionally as automatically when the archer selects a target and begins to draw the string back. Equally important, the laser will automatically turn off when the arrow is released or the bow is returned to the ready position and pressure on the actuation switch is released.

[0040] The terms and expressions which have been employed in the foregoing specification are used therein as terms of description and not of limitation, and there is no intention in the use of such terms and expressions to exclude equivalents of the features shown and described or portions thereof, it being recognized that the scope of the invention is defined and limited only by the claims which follow.

What is claimed is:

1. A sighting device for an archery bow, comprising:
- a directed beam light source;
- a power source for providing power to said directed beam light source;
- an actuation switch for allowing power to flow from said power source to said light source;
- a circuit for interconnecting said light source, said power source and said actuation switch; and
- a jacket adapted to be attached to an archery bow, said light source, said power source, said actuation switch and said circuit being disposed within said jacket so that, when said jacket is attached to the archery bow said light source directs light forwardly from said bow toward a target and so that said actuation switch can be actuated by the hand of a person holding said bow by said jacket.

2. The sighting device of claim **1**, wherein said bow has a back, two sides, an upper end and a lower end and said jacket has a back portion and two opposing side portions for covering portions of said back and said two sides of said bow, and an upper end corresponding to said upper end of said bow and a lower end corresponding to said lower end of said bow.

3. The sighting device of claim **2**, wherein said actuation switch is disposed in said back portion of said jacket.

4. The sighting device of claim **3**, wherein said actuation switch is disposed more toward said upper end of said grip than toward said lower end of said jacket so as to actuate and thereby allow power to flow from said power source to said light source, in response to the pressure naturally applied by the user's hand when the bow string is drawn.

5. The sighting device of claim **4**, wherein said actuation switch is a spring return pushbutton switch adapted to close when the hand of a user applies pressure to said jacket as the bow is drawn and thereby allow power to flow from said power source to said light source, and to open when pressure on said switch is released.

6. The sighting device of claim **5**, wherein said jacket has a thinner portion disposed at the position of said actuation switch and said actuation switch is disposed interior to said jacket beneath said thinner portion of said jacket.

7. The sighting device of claim **6**, wherein outer surfaces of said back and two sides of said jacket are shaped so as to conform generally to the palm, thumb and four fingers of a human hand whereby the thumb is on one side of the jacket, the four fingers are on the other side of the jacket, and the web of tissue between the thumb and forefinger is disposed substantially over said actuation switch.

8. The sighting device of claim **7**, wherein said directed beam light source comprises a laser.

9. The sighting device of claim **8**, wherein said laser is disposed on the same side of said jacket as the user's fingers lay during use, more toward said upper end of said jacket than toward said lower end of said grip.

10. The sighting device of claim **9**, wherein said jacket comprises first and second interlocking parts, the first of said interlocking parts substantially comprising said first side and said back side of said jacket and the second of said interlocking parts substantially comprising the second side of said jacket.

11. The sighting device of claim **10**, wherein said actuation switch is a flexible membrane switch.

12. The sighting device of claim **10** wherein said circuit comprises a flexible circuit.

13. The sighting device of claim **8**, said actuation switch is a flexible membrane switch.

14. The sighting device of claim **8** wherein said circuit comprises a flexible circuit.

15. The sighting device of claim **2**, wherein outer surfaces of said back and two sides of said jacket are shaped so that when the thumb of a user is on one side of the jacket and the four fingers are on the other side of the jacket, the web of tissue between the thumb and forefinger is disposed substantially over said actuation switch.

16. The sighting device of claim **15**, wherein said directed beam light source comprises a laser.

17. The sighting device of claim **15**, wherein said laser source is disposed on the same side of said jacket as the user's fingers during use, more toward said upper end of said grip than toward said lower end of said jacket.

18. The sighting device of claim **1**, wherein said directed beam light source comprises a laser.

19. The sighting device of claim **18**, wherein said laser is disposed on one side of said jacket more toward said upper end of said jacket than toward said lower end of said jacket.

20. The sighting device of claim **18**, further comprising a laser assembly for holding said laser, said jacket including devices adapted to interact with said laser assembly so as to adjust said laser for elevation and windage.

21. The sighting device of claim **1**, wherein said actuation switch is a spring return pushbutton switch adapted to close when the hand of a user applies pressure to said jacket so as to allow power to flow from said power source to said light source, and to open when pressure on said switch is released.

22. The sighting device of claim **1**, wherein said jacket comprises first and second interlocking parts, the first of said interlocking parts substantially comprising a first side and a back side of said jacket corresponding to one side of said bow, and the second of said interlocking parts substantially comprising a second side of said jacket corresponding to the other side of said bow.

23. The sighting device of claim **22**, wherein said directed beam light source and said actuation switch are disposed in said first part of said jacket, said light source being disposed more toward the upper end of said jacket than the lower end thereof, on said first side thereof, and said actuation switch being disposed more toward an upper end of said grip than the lower end thereof, on said back side thereof.

24. The sighting device of claim **1**, said actuation switch comprises a flexible membrane switch.

25. The sighting device of claim **1**, wherein said circuit comprises a flexible circuit.

26. An archery bow having a directed light beam aiming device, comprising:

a bow member;

a jacket disposed on said bow member for holding the bow with one hand;

a directed beam light source disposed within said jacket so as to direct light toward a target when said light source is actuated;

a power source disposed within said jacket for providing power to said light source;

an actuation switch disposed within said jacket for allowing power to flow from said power source to said light source; and

a circuit disposed within said jacket for interconnecting said light source, said power source and said actuation switch, said actuation switch being disposed within said jacket so that during use, said actuation switch can be actuated by the same hand that is holding the bow.

27. The archery bow of claim **26**, wherein said jacket has an upper end and a lower end and said actuation switch is disposed more toward said upper end than said lower end so as to close and thereby allow power to flow from said power source to said light source in response to the pressure naturally applied when the bow string is drawn.

28. The archery bow of claim **27**, wherein said actuation switch is a spring return pushbutton switch adapted to close when the hand of a user applies pressure to said jacket as the bow is drawn, and to close when pressure on said switch is released.

29. The archery bow of claim **28**, wherein said directed light beam source is a laser.

30. The archery bow of claim **26**, wherein said directed light beam source is a laser.

31. The archery bow of claim **26**, wherein said jacket has an upper end and a lower end, said directed light beam source is a laser, and said laser is disposed on the same side of said jacket as the user's fingers lay during use, more toward said upper end of said jacket than said lower end of said jacket.

32. The archery bow of claim **26**, wherein outer surfaces of said jacket are shaped so that when the thumb of a user is on one side of the jacket and the four fingers are on the other side of jacket, the web of tissue between the thumb and forefinger is disposed substantially over said actuation switch.

33. The archery bow of claim **32**, wherein said directed light beam source is a laser.

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