I. TITLE: *"SMART FISHING ROD"*

II. BACKGROUND OF THE INVENTION

1. Field of the Invention.

[001] The present application is a U.S. Non-Provisional Patent Application claiming priority of U.S. Provisional Patent Application Serial No **63/151,305** filed on **February 19th, 2021**, which is hereby incorporated by reference.

2. Field of the Invention

[002] The present invention relates to a smart fishing rod and, more particularly, to a smart fishing rod that includes an electrical assembly, wherein said electrical assembly further includes devices such as speakers, light system, a device for wireless communication. The smart fishing rod introduces an innovative way of fishing

3. Description of the Related Art.

[003] Several designs for fishing rods have been designed in the past. None of them, however, include electrical components enclosed by modular sections of a fishing rod defining smart modules, meaning that a fisherman can incorporate one of

the smart modules to a preexistent fishing rod to make it a smart fishing rod. The smart modules are interchangeable. For instance, a user may incorporate two modules that encloses the batteries for longer use.

[004] Applicant believes that a related reference corresponds to U.S. patent No. 7,131,231 issued for a multifunction electronic fishing float having an identification number which automatically generates radio frequency signals. Applicant believes that another related reference corresponds to U.S. patent publication No. 2006/0265931 published for a fish bite or strike alarm which is attachable to multiple types of rod holders. However, the present invention differs from the cited references because they fail to disclose a modular smart fishing rod comprising a rod assembly, a spring assembly, and a magnet track assembly.

[005] Other documents describing the closest subject matter provide for a number of more or less complicated features that fail to solve the problem in an efficient and economical way. None of these patents suggest the novel features of the present invention.

III. SUMMARY OF THE INVENTION

[006] It is one of the objects of the present invention to provide a smart fishing rod which accurately notifies a user if a fish is nibbling on the hook of a fishing rod or if a fish has bitten the hook.

[007] It is one of the objects of the present invention to provide a smart fishing rod that can be held by a rod holder and permit a user to leave the rod unsupervised and then notified by means of audible and visual alerts that a fish has bitten the hook.

[008] It is one of the objects of the present invention to provide a smart fishing rod which include smart modules that can be incorporated to preexisting modular fishing rods to make them smart rods.

[009] It is another object of this invention to provide a smart fishing rod which enhances a fishing experience by providing the tools necessary to determine when there is fish activity near the fishing hook.

[010] It is still another object of the present invention to provide a smart fishing rod which is intuitive and easy to use.

[011] It is yet another object of this invention to provide such a device that is inexpensive to implement and maintain while retaining its effectiveness.

[012] Further objects of the invention will be brought out in the following part of the specification, wherein detailed description is for the purpose of fully disclosing the invention without placing limitations thereon.

IV. BRIEF DESCRIPTION OF THE DRAWINGS

[013] With the above and other related objects in view, the invention consists in the details of construction and combination of parts as will be more fully understood from the following description, when read in conjunction with the accompanying drawings in which:

Figure 1 represents an operational view of a user fishing with the smart fishing rod **10**.

Figure 1A represents an operational view of the present invention **10** being held by a rod holder **H**.

Figure 2 shows an isometric view of the smart fishing rod **10** in accordance with an embodiment of the present invention.

Figure 3 illustrates an exploded view of the smart fishing rod **10** depicting the handle portion **22**, the central portion **24**, the reel **28**, and the pole portion **26**. Ferrules **62** are used to secure each portion together. Wherein said reel **28** is removably attached to said central portion **24**.

Figure 4 is an enlarged view of the pole portion **26** depicting the lights mounted thereon **43**.

Figure 5 illustrates an enlarged view of the central portion **22** having elements of the electrical assembly **40** and the reel **28** attached thereon.

Figure 6 depicts a cross sectional view of the central portion **24** and the reel **28**.

Figure 7 illustrates a cross sectional view of the handle portion **22** enclosing the power cells **51**.

Figure 8A shows a front view of the central portion having electric connectors **48** thereon to transmit charge and information between portions.

Figure 8B shows a rear view of the central portion having electric connectors **48** thereon to receive charge and information between portions.

Figure 9 represents another embodiment of the present invention wherein the smart fishing rod is composed of a single piece **120**.

V. DETAILED DESCRIPTION OF THE EMBODIMENTS OF THE INVENTION

[014] Referring now to the drawings, where the present invention is generally referred to with numeral **10**, it can be observed that it basically includes a fishing rod

assembly **20**, an electrical assembly **40**, a fastening assembly **60**, a spring assembly **80**, and a magnetic track assembly **90**. It should be understood there are modifications and variations of the invention that are too numerous to be listed but that all fit within the scope of the invention. Also, singular words should be read as plural and vice versa and masculine as feminine and vice versa, where appropriate, and alternative embodiments do not necessarily imply that the two are mutually exclusive.

[015] The fishing rod assembly includes a fishing rod **21**. Fishing rod **21** that resembles the fishing rods that are utilized in traditional recreational fishing activities. In different embodiments, the fishing rod 21 may be a spin fishing rod, a casting fishing rod, a telescopic fishing rod, a fly-fishing rod, an ultra-light fishing rod, a surf fishing rod, a trolling fishing rod, an ice fishing rod. It should be understood that the fishing rod is not limited to being any specific variety of fishing rod. Any fishing rod may be implemented into the present system. In a preferred embodiment the fishing rod **21** may include a handle portion **22**, a central portion **24**, and a pole portion **26** defining a modular fishing rod **21**. The fishing rod **21** may be made of a flexible, durable, and sturdy material. Fishing rod **21** may be made of carbon steel, alloy steel, stainless steel, tool steel, brass, bronze, iron, aluminum, nickel-based alloy, ceramics, polymers, fibers, metal alloy, composite materials, fiberglass, graphite, or any variation or combination thereof. The fishing rod **21** may have a predetermined length. In a suitable embodiment, fishing rod **21** may have a substantially elongated cylindrical shape. The handle portion **22** may be volumetrically suitable to be handheld. Handle portion **22** may be ergonomically designed to be comfortable to use.

Central portion **24** may have an elongated cylindrical shape. Central portion **24** may be volumetrically suitable to receive electric devices therein. Central portion may be removably attached to the handle portion **21** at a distal end. The pole portion **26** may be removably attached to the central portion **24** at a distal end. Pole portion **26** may be an elongated member which may have a smaller diameter that a diameter of the central portion **24** and the handle portion **22**. Pole portion **26** may be larger in length that the central and handle portions (**22**, **24**). In a suitable embodiment the pole portion **26** may include guides **26a**. Additionally, pole portion **26** may include generic elements such as tip tops, windings, and the like. The guides **26a** may be circular pieces located along said pole portion **26** separated by a predetermined distance. Guides **26** may have a central opening that receives a fishing line therethrough to provide stability. Guides **26a** may be made of polymers, metals, ceramics, or the like. In another embodiments, the guides **26a** may have a quadrangular shape, an oval shape, an irregular shape, or any variation thereof. A reel **28** may be detachable attached to the central portion **26**. The reel **28** may house the fishing line. The reel **28** may be used to wind and stow the fishing line. As depicted in **figure 3**. The handle portion, the central portion, and the pole portion (**22**, **24**, **26**) may include threaded portions which receive fasteners to secure the portions (**22**, **24**, **26**) together.

[016] The fastening assembly **60** includes ferrules **62**. Ferrules **62** may be made of a resistant, durable, and sturdy material. Ferrules **62** may be made of carbon steel, alloy steel, stainless steel, tool steel, brass, bronze, iron, aluminum, nickel-based alloy, ceramics, polymers, fibers, metal alloy, composite materials, fiberglass, graphite, or

any variation or combination thereof. Ferrules **62** may have a cylindrical shape. Ferrules **62** may be male ferrules or female ferrules. Male ferrules may fit into the join of another piece. Female ferrule may receive the male ferrule. Ferrules **62** may be used to ensemble together the handle portion, the central portion, and the pole portion (**22**, **24**, **26**). Ferrules **62** may be attached to distal ends of said handle portion **22**, central portion **24**, and pole portion **26**.

[017] The electrical assembly **40** may include a microprocessor **41**, a transceiver unit **42**, lights **43**, buttons **44**, a display **45**, speakers **46**, a USB port **47**, electric connectors **48**, a memory card slot **49**, a microphone **50**, and power cells **51**, a charging port **52**, and a tension sensor **53**. The electrical assembly is configured to convert the fishing rod **21** into a smart fishing rod by including technology thereat. In a suitable embodiment, the handle portion **22** may enclose the power cells **51** as depicted in **Figure 7**. Power cells **51** may be non-rechargeable such as zinc-carbon battery, magnesium battery, mercury battery, lithium/solid cathode battery, lithium/solid electrolyte battery. In another embodiment the power cells **51** may be rechargeable, a rechargeable power cell may be a nickel cadmium battery. Power cells **51** may supply electric energy to the rest of the components. In a suitable embodiment the handle portion **22** may include a charging port **52**. The charging port **52** may be electrically connected to the power cells **51** to recharge the power cells **51** from an external source. Additionally, the electrical assembly **40** may include solar panels **54**. Solar panels **54** may be a hardware component mounted onto the fishing rod **21** configured to transform solar energy gathered from a light source to electrical energy.

Electrical energy converted by the solar panels **54** may be used to supply voltage and current to the elements of the electrical assembly **40**. Furthermore, the electrical energy converted by the solar panels **54** may be used to recharge the power cells **51**. Solar panels **54** may provide a suitable charging option for longer bait times. In a suitable embodiment, the solar panels **54** may be mounted onto the central portion, nonetheless, in other embodiments, the solar panels **54** may be mounted onto an exterior surface of the handle portion **22** or the pole portion **26**. In a suitable embodiment the solar panels **54** may use perovskite solar cells to convert solar energy into electrical energy. However, it should be understood that said solar panels **53** may any form of solar cells for the aforementioned purpose. The buttons **44** may be located about an exterior surface of the central portion **24**. Each of the buttons **44** may be pushbutton switch, a toggle switch, a selector switch, or any variation thereof. In a suitable embodiment the buttons **44** are placed longitudinally along the central portion in a linear disposition. However, in other embodiments the buttons **44** may be arranged in different dispositions such as a matrix layout, or the like. The buttons **44** may be electrically connected to the microprocessor **41** to perform predetermined actions. In one embodiment the buttons **44** may include a power button to turn on and off the electric elements of the present invention **10**, a pair button configured to allow a user to connect an electronic portable device with the smart fishing rod **10** by means of the transceiver unit **42**, volume buttons turn up/down the volume of the audible information coming out of the speakers **46**. The display **45** may be mounted on the central portion **24**. In a suitable embodiment the display **45** may be an organic light-emitting diode (OLED) display. Nonetheless, other variety of displays may be used

such as field sequential color LCD display, EBT LCD display, thin-film-transistor LCD display, or any variation thereof. The display **45** may be used to present information in visual form. The display **45** may be powered by the power cells **51**. The display **45** may be electrically connected to the microprocessor **41** so the microprocessor **41** may send information to be presented by the display **45**. In a suitable embodiment the speaker **46** may be attached to the central portion **24**. As depicted in **figure 5** the speakers **46** may be placed longitudinally along the central portion **46**. In other embodiments, the speakers **46** may transversely cover a section of the central portion surface. The speakers **46** may be electrically connected to the microprocessor **41** to provide predetermined audible information. The USB port **47** may be located on the central portion **24** proximal to the buttons **44**. Nonetheless, in other embodiments the USB port **47** may be located wheresoever on the central portion **24**. The USB port **47** may be an USB-A type port, an USB-C type port, a lightning type port, a micro-USB type port or any variation thereof. The USB port **47** may be electrically connected to the microprocessor **41** to receive and send predetermined information. Camera **55** may be attached to the central portion **24**. However, in other embodiments, camera **55** may be attached to a distal end of the pole portion **26**. Camera **55** may record video images. Camera **55** may be electrically connected to the display **45** to show video images recorded thereon. Camera **55** may include ultra-wide-angle lens that create a wide panoramic image. Camera **55** having ultra wide angle lens may be capable of 180° recording. Camera **55** may be suitable to record the fishing process. Camera **55** may be electrically connected to the microprocessor **41**. Microprocessor **41** may be configured to receive a video signal

from the camera **55**. Microprocessor **41** by means of the camera **55** may monitor activity around the hook. When movement around the hook is detected, the microprocessor **41** may actuate the speakers **46** to provide an audible alert to a user notifying them of the activity sensed on the hook of the fishing rod **21**. The memory card slot **49** may be suitable to insert a memory card therein and store the videos recorded by the camera **55**. The memory card slot **49** may be located on the central portion **24** proximal to the buttons **44**, opposite to the USB port **47**. The microphone **50** is an electrical device that converts sound into electrical signals. Microphone **50** may be configured to receive voice commands which are acquired and processed by the microprocessor **41** to perform predetermined functions. The transceiver unit **42** may be embedded within the central portion. The transceiver unit **42** may be electrically connected to the microprocessor **41** to send and receive information. The transceiver unit **42** may allow wireless connection between the smart fishing rod **10** and an electronic device such as a smartphone, a laptop, a tablet, or the like. The transceiver unit **42** may receive and send a signal having format of an electromagnetic radiation. Transceiver unit **42** may use wireless technology such as ultrasonic technology, infrared technology, RF technology, Wi-Fi™ technology, Bluetooth™ technology, or any variation thereof. In another embodiment, it can be further implemented a mobile application to remotely control predetermined functions of the present invention **10**. The tension sensor **53** may be connected with the fishing line (not shown in the drawings). The tension sensor **53** may be an analog/digital device that may measure the amount of pulling force/tension that a fish may exert when hooked. The tension sensor **53** may be electrically connected to the microcontroller

41. The tension sensor **53** may generate an electrical signal which may be acquired by the microprocessor **41** to give warnings based on inputs of predetermined tensions measured by the sensor **53**. The microprocessor **41** may be embedded within the central portion as depicted in **figure 6**. The microprocessor **41** may be a compact integrated circuit designed to govern predetermined operations on a system. Microprocessor **41** may include a processor, a memory, and input/outputs peripherals. Microprocessor **41** may be the central unit that receives and sends electrical signals to the other components of the electrical assembly **40**. The lights **43** may be longitudinally attached to the pole portion **26** as depicted in **figure 4**. Lights **43** may be mounted on the guides **26a**. Lights **43** may cover a circumference of each guide from the guides **26a**. The lights **43** may be LED lights. In another embodiment, the lights **43** may be a RGB LED lights in which each LED has its own chip meaning they can be individually triggered for chasing, strobing, and color changing. In another embodiment, the lights **43** may be RGBW LED lights, multicolor LED lights, RGBCCT LED lights, or any variation thereof. The microprocessor **41** may turn the lights **43** to a predetermined color that is related to the force measured by the tension sensor **53**. Lights **43** on the pole portion **26** may be actuated to indicate to a user that there has been a nibble on the hook. In a preferred embodiment, as the tension measured by the tension sensor **53** increases the lights **43** on the pole portion **26** may change color starting at a bottom and moving to the tip for a visual effect, the higher the tension measures, the higher the lights **43** may go up.

[018] As depicted in **figures 8A-8B**, the electric connectors **48** may be internally connected at distal ends of the portions (**22**, **24**, **26**). The electric connectors **48** may permit to wirelessly transmit electric power and predetermined information between the portions (**24**, **22**, **26**). In one embodiment the present invention may use wireless power transfer technology, wireless power transmission technology, wireless energy transmission technology, or any other suitable means for wirelessly transmitting power as known in the art. In a suitable embodiment a user may be able to connect additional portions enclosing power cells **51** for longer use. The electric connectors may allow a user to implement one of the portions of the smart fishing rod to a preexisting modular rod to make it a smart rod.

[019] Spring assembly **80** includes a hooked spring **82** and a nibble spring **84**. In the present embodiment, hooked spring **82** is provided as a spring which has a higher spring constant than that of the nibble spring **84**. As a result, the hooked spring **82** requires a substantially greater amount of force to result in displacement. In one implementation, the nibble spring **84** experiences displacement due to the force actuated on the reel line when a fish nibbles on the hook of the fishing rod. As a result, the lights **43** are then actuated to indicate to a user that there has been a nibble on the hook.

[020] Magnetic track assembly **90** includes a magnetic track containing a magnet **92** which is operatively connected with the hooked spring **82**. In one embodiment, the hooked spring **82** experiences displacement due to the force of a bite experienced on

the fishing hook. As a result, the magnet then moves back and further along the track due to the energy being transferred from the hooked spring **82**. Furthermore, the magnetic track **94** is operatively connected to a sliding reel holder (not shown in figures) on the handle portion. The sliding reel holder then causes the reel of the handle to move back and forth corresponding to the movement of the magnet **92** along the magnetic track **94**.

[021] In another embodiment, the smart fishing rod **10** may include an actuation mechanism **110** that may be connected to said reel **28** configured to automatically start reeling in when a fish is detected. The actuation mechanism **110** may use the tension sensor **53** as a feedback element to determine the torque that needs to be applied depending on the pulling force detected by the sensor **53**.

[022] The foregoing description conveys the best understanding of the objectives and advantages of the present invention. Different embodiments may be made of the inventive concept of this invention. It is to be understood that all matter disclosed herein is to be interpreted merely as illustrative, and not in a limiting sense.

VI. CLAIMS

What is claimed is:

1. A smart fishing rod system, comprising:
   a) a fishing rod assembly including a fishing rod with a handle portion;
   b) a spring assembly operatively mounted towards said handle portion of the fishing rod, said spring assembly including a hooked spring and a nibble spring, wherein said spring assembly is operatively connected to lights powered by power cells stored within the handle portion; and
   c) a magnet track assembly including a magnetic track with a magnet disposed within the handle portion, said magnetic track being operatively connected with a sliding reel holder containing a reel, wherein the smart fishing rod system is configured to notify a user if a fish nibbles on a hook by activating the lights or bites the hook by actuating the magnetic track.

2. The smart fishing rod of claim 1, wherein said fishing rod further includes a central portion and a pole portion, the handle portion is removably attached to the central portion, the pole portion is removably attached to the central portion opposite to the handle portion.

3. The smart fishing rod of claim 1, wherein said fishing rod further includes a removably reel.

4. The smart fishing rod of claim 2 further includes an electrical assembly including buttons, a display, speakers, a USB port, electric connectors, a microphone, a transceiver, a tension sensor, the lights, a camera, and a microprocessor.

5. The smart fishing rod of claim 2 further includes a fastening assembly including ferrules, said ferrules secure together said central portion, said handle portion, and said pole portion.

6. The smart fishing rod of claim 4, wherein said buttons, said display, said speakers, said USB port, and said microphone are mounted on said central portion.

7. The smart fishing rod of claim 4, wherein said tension sensor is an analog/digital device that measures the amount of pulling force/tension that a fish may exert when hooked, the tension sensor is electrically connected to the microcontroller, the tension sensor generates an electrical signal which is acquired by the microprocessor to give warnings based on inputs of predetermined tensions measured by the sensor.

8. The smart fishing rod of claim 4, wherein said electric connectors are internally located in distal ends of the handle portion, the central portion, and the pole portion, the electric connectors wirelessly transmit electric power and predetermined information between the central portion, the handle portion, and the pole portion.

9. The smart fishing rod of claim 1, wherein said lights are longitudinally mounted on the pole portion.

10. The smart fishing rod of claim 8, wherein said central portion and said handle portion are interchangeable to add additional power cells for longer wait times.

11. The smart fishing rod of claim 5, wherein said ferrules are attached to said handle portion, said central portion, and said pole portion at distal ends.

12. The smart fishing rod of claim 2, wherein said pole portion includes guides.

13. The smart fishing rod of claim 2, wherein said lights are mounted along said pole portion and on said guides.

14. The smart fishing rod of claim 4, wherein said electrical assembly further includes a camera and a memory card slot, said microprocessor receives a

video signal from the camera, said microprocessor by means of the camera monitors activity around the hook, when movement around the hook is detected, the microprocessor actuates the speakers to provide an audible alert.

15. The smart fishing rod of claim 4, wherein said electrical assembly includes solar panels, said solar panels is a hardware component mounted onto the fishing rod configured to transform solar energy gathered from a light source to electrical energy.

16. A smart fishing rod system, comprising:

a) a fishing rod assembly including a fishing rod having a handle portion, a central portion, and a pole portion, said pole portion includes guides;

b) a fastening assembly including ferrules, said ferrules are located at distal ends of the central portion, handle portion and pole portion, said ferrules are used to ensemble together the handle portion, the central portion, and the pole portion;

c) an electrical assembly including buttons, a display, speakers, a USB port, electric connectors, a microphone, a transceiver, a tension sensor, lights, a camera, solar panels, a memory card slot, and a microprocessor, said tension sensor measures the amount of pulling force/tension that a fish may exert when hooked, the tension sensor is electrically connected to the microcontroller, the tension sensor generates an electrical signal which is acquired by the microprocessor

to give warnings based on inputs of predetermined tensions measured by the sensor, said lights are mounted along said pole portion including the guides,

d) a spring assembly operatively mounted towards said handle portion of the fishing rod, said spring assembly including a hooked spring and a nibble spring, wherein said spring assembly is operatively connected to said lights powered by power cells stored within the handle portion;

e) a magnet track assembly including a magnetic track with a magnet disposed within the handle portion, said magnetic track being operatively connected with a sliding reel holder containing a reel, wherein the smart fishing rod system is configured to notify a user if a fish nibbles on a hook by activating the lights or bites the hook by actuating the magnetic track.

17. The smart fishing rod of claim 16, wherein said solar panels is a hardware component mounted onto the fishing rod configured to transform solar energy gathered from a light source to electrical energy.

18. The smart fishing rod of claim 16, wherein said electric connectors are internally located in distal ends of the handle portion, the central portion, and the pole portion, the electric connectors wirelessly transmit electric power and predetermined information between the central portion, the handle portion, and the pole portion.

19. The smart fishing rod of claim 16, wherein said central portion and said handle portion are interchangeable to add additional power cells for longer wait times.

20. A smart fishing rod, consisting of:

a) a fishing rod assembly including a fishing rod having a handle portion, a central portion, and a pole portion, said pole portion includes guides;

b) a fastening assembly including ferrules, said ferrules are located at distal ends of the central portion, handle portion and pole portion, said ferrules are used to ensemble together the handle portion, the central portion, and the pole portion;

c) an electrical assembly including buttons, power cells, a display, speakers, a USB port, electric connectors, a microphone, a transceiver, a tension sensor, lights, a camera, solar panels, a memory card slot, and a microprocessor, said tension sensor measures the amount of pulling force/tension that a fish may exert when hooked, the tension sensor is electrically connected to the microcontroller, the tension sensor generates an electrical signal which is acquired by the microprocessor to give warnings based on inputs of predetermined tensions measured by the sensor, said lights are mounted along said pole portion including the guides, said electric connectors are internally located in distal ends of the handle portion, the central portion, and the pole portion, the electric connectors wirelessly transmit electric power and

predetermined information between the central portion, the handle portion, and the pole portion, said solar panels is a hardware component mounted onto the fishing rod configured to transform solar energy gathered from a light source to electrical energy, electrical energy generated by the solar panels is stored by said power cells.

d) a spring assembly operatively mounted towards said handle portion of the fishing rod, said spring assembly including a hooked spring and a nibble spring, wherein said spring assembly is operatively connected to said lights powered by said power cells stored within the handle portion, said central portion and said handle portion are interchangeable to add additional power cells for longer wait times;

e) a magnet track assembly including a magnetic track with a magnet disposed within the handle portion, said magnetic track being operatively connected with a sliding reel holder containing a reel, wherein the smart fishing rod system is configured to notify a user if a fish nibbles on a hook by activating the lights or bites the hook by actuating the magnetic track, said microprocessor receives a video signal from the camera, said microprocessor by means of the camera monitors activity around the hook, when movement around the hook is detected, the microprocessor actuates the speakers to provide an audible alert.

ABSTRACT OF THE DISCLOSURE

A smart fishing rod includes a rod assembly, a spring assembly, and a magnetic track assembly. In one embodiment, the rod assembly resembles a modular fishing rod that is used in recreational fishing. The spring assembly is mounted towards the handle portion of the rod assembly. Additionally, the spring assembly includes a hooked spring and a nibble spring. The spring assembly is also operatively connected to a plurality of LED lights to notify a user when a fish is caught or nibbles on the line of the rod assembly. When a fish is caught, the magnet track assembly allows for the reel within the sliding reel holder to move back and forth thereby notifying a user that there is a fish on the line.