A SELF CHARGEABLE BIO-FUELING MICRO BATTERY WITH GLUCOSE BURNING CHAMBER

ABSTRACT

[0001] Exemplary preferred embodiment of the present disclosure is directed towards a self-chargeable bio-fuelling micro battery with glucose burning chamber. The self chargeable bio-fuelling micro battery comprising a bio-membrane configured to diffuse by plurality of bio fluids for charging. The bio-membrane includes a biocompatible compartment storing at least one of chemical substance configured to operate plurality of bio-medical implant devices, one or more bio fuel compartments configured to store bio-fuels for generating electrolyte and create a conductive path for electrons emitted by electrodes and a processor in communication with the biocompatible compartment through plurality of connectors interface with the one or more bio fuel compartments to control the communication between user and the bio medical implant devices.

TECHNICAL FIELD

[0002] The present disclosure generally relates to portable power equipment. More particularly, the present disclosure relates to a self chargeable bio-fuelling micro battery with glucose burning chamber

BACKGROUND

[0003] The number of implantable medical devices has dramatically increased in the field of medicine. Over the last decade, the use of stents, drug eluting stents, pacemakers, defibrillators, ventricular assist devices, glucose infusion pumps and neurostimulators has increased many folds. Some of the above enumerated examples, as well as a number of other implantable and/or non-implantable medical devices are active devices and require power sources for operation. The power source of this invention has many applications such as monitoring and burning excess glucose in the blood. This is especially important for pill and insulin dependent diabetics who rely on external monitoring of their blood sugar levels.

[0004] The conventional power sources or batteries that are utilized in conjunction with implantable or non-implantable medical devices typically have stringent specifications imposed on them relative to physical size and performance. In older generation, batteries that were designed for implantable medical devices were larger devices with a relatively short useful life. However, with the advent of miniature implantable medical devices for such diverse applications as drug delivery, glucose sensing and monitoring, and neurostimulation, batteries capable of providing useful power and occupying ever smaller volumes are required. In addition to small size, a battery that is to be implanted should preferably include a useful life, insignificant self-discharge rates, a high reliability over a long time period, and compatibility with a patient's internal body chemistry, in other words, it should be as biocompatible as possible. Biocompatible coatings and/or encapsulates may be utilized to meet this need.

[0005] Implantable devices require power source for functional operation. For example, pacemakers have been widely used to stimulate heart muscles and lithium batteries are used to provide power. Emerging technologies such as MEMS (Micro Electro Mechanical Systems) promise to improve the quality of life for patients suffer from chronicle diseases. Implantable sensors made by MEMS technology have the advantages of low-cost, small-in-size, easy integration with the controlling integrated circuits (ICs) and low power consumption. However, the size of conventional lithium batteries is large compared to the MEMS-based sensors and post-processing will often be needed to integrate the battery with the sensors.

[0006] In the light of aforementioned discussion there exists a need of a self-chargeable bio-fuelling micro battery used for functioning of medical implant devices

BRIEF SUMMARY

[0007] The following presents a simplified summary of the disclosure in order to provide a basic understanding to the reader. This summary is not an extensive overview of the disclosure and it does not identify key/critical elements of the invention or delineate the scope of the invention. Its sole purpose is to present some concepts disclosed herein in a simplified form as a prelude to the more detailed description that is presented later.

[0008] An exemplary preferred embodiment of the present disclosure is to provide an all-in-one technology battery that charges from plurality of body fluids which may include but not limited blood, glucose and the like.

[0009] Another exemplary preferred embodiment of the present disclosure is to provide biocompatible and inert metal electrodes that do not affect body and health.

[0010] Exemplary preferred embodiment of the present disclosure is directed towards a self-chargeable bio-fuelling micro battery. According to a first aspect, the self-chargeable bio-fuelling micro battery includes a bio-membrane configured to diffuse by plurality of bio fluids for charging. The bio fuels comprise blood fuel cell, glucose fuel cell and microbial fuel cell. The bio fuels receive electrolyte from abdomen and microbes from intestine to form fuel.

[0011] According to the first aspect, the self-chargeable bio-fuelling micro battery including the bio-membrane includes a biocompatible compartment used to store at least one of chemical substance configured to operate plurality of bio-medical implant devices. The chemical substances stored in biocompatible compartment comprise acid solutions, sugar solution including hydrochloric acid, potassium chloride, sodium chloride, sugar and glucose. The bio compartment is refueled by food in gestation or directly swallowing biological acid juices comprising lemon juice, orange juice, pineapple juice, and sour juice through a refillable balloon nipple. The refillable balloon nipple is formed by a biocompatible silicon rubber and any other similar biocompatible material. Also, one or more therapies such as intravenous therapy, skin patch, feet bath and the like configured to infuse plurality of chemical substances into human body to recharge the micro battery. Also the capability to use intravenous drip, patch or foot baths in the case where there is difficulty swallowing.

[0012] According to the first aspect, the self-chargeable bio-fuelling micro battery including the bio-membrane includes one or more bio fuel compartments configured to store bio-fuels for generating electrolyte and create a conductive path of electrons emitted by electrodes. The bio fuel compartments that are separated by a biological membrane are used for sealing and separating. The material used for sealing may include but not limited to a silicon rubber, diaphragm, titanium and the like.

[0013] According to the first aspect, the self-chargeable bio-fuelling micro battery including the bio-membrane includes a processor in communication with the biocompatible compartment through plurality of connectors interface with the one or more bio fuel compartments used to control the communication between user and the bio medical implant devices. The processor maintains constant power supply for the bio medical implants. The processor provides plurality of instructions to the one or more bio fuel compartments automatically by an inbuilt memory in an intellectual style. The processor turns on the bio membrane in the absence of the availability of fuel in the one or more bio fuel compartments. The processor turns on/off automatically by recharging the one or more bio fuels compartments. Further, the processor may configured with transceiver to receive global positioning signals for locating and tracking the micro battery based on the user preferences.

[0014] The transceiver collects the global positioning system chip information and transmits to the portable device where, the portable device with a unique identification number receives the signal and also a tuning capacitor included in the processor receives power from the one or more bio fuel compartments and transmits to authenticated portable device. An application downloaded in the portable device interprets the radio signals and displays the code number and translates the code to a message. Also the wireless transceiver establishes a communication with a portable device by using multiple wireless technologies such as RFID, Zig bee, Wi-Fi, Li-Fi and the like.

BRIEF DESCRIPTION OF DRAWINGS

[0015] Other objects and advantages of the present invention will become apparent to those skilled in the art upon reading the following detailed description of the preferred embodiments, in conjunction with the accompanying drawings, wherein like reference numerals have been used to designate like elements, and wherein:

[0016] FIG.1 is a diagram illustrating an exemplary preferred embodiment of a self chargeable bio-fuelling micro battery consistent with the disclosed embodiments.

[0017] FIG. 2 is a diagram illustrating an exemplary preferred embodiment of plurality of compartments used to generate power.

[0018] FIG. 3 is a diagram illustrating an exemplary preferred embodiment of a closed container implanted in human body.

[0019] FIG. 4 is a diagram illustrating an exemplary preferred embodiment of establishing a communication with a portable device.

[0020] FIG. 5 is a flow diagram illustrating an exemplary method of self chargeable bio-fueling micro battery.

[0021] FIG. 6 is a diagram illustrating glucose sensors for measuring a level of glucose in the blood with an exemplary preferred embodiment.

DETAIL DESCRIPTION

[0022] It is to be understood that the present disclosure is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the drawings. The present disclosure is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting.

[0023] The use of "including", "comprising" or "having" and variations thereof herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. The terms "a" and "an" herein do not denote a limitation of quantity, but rather denote the presence of at least one of the referenced item. Further, the use of terms "first", "second", and "third", and the like, herein do not denote any order, quantity, or importance, but rather are used to distinguish one element from another.

[0024] FIG.1 is a diagram 100 illustrating an exemplary preferred embodiment of a self chargeable bio-fuelling micro battery consistent with the disclosed embodiments. According to a non limiting preferred embodiment of the present disclosure, the self chargeable bio-fuelling micro battery 102 designed in the form of a capsule and analogous to the half size of a grain of rice. The micro battery 102 encapsulated in glass or titanium material is biocompatible and includes a closure made of polypropylene polymer to avoid the movement of the micro battery 102 after placing inside the implant. The polymer also used to hold the micro battery 102 in the arranged place by forming the connective tissue and other kinds of cells around it. The micro battery 102 is positioned in between a stomach flesh and intestine flesh to operate bio-medical implant devices which may include but not limited to deep brain Neurostimulators, cochlear implants, gastric stimulators, cardiac defibrillators/pacemakers, foot drop implants, insulin pumps and the like. Also the micro battery 102 placed inside the human body is removed surgically.

[0025] As shown in Figure 1, the micro battery 102 includes a bio membrane 104 used to diffuse the power in active and passive mode for charging the batteries itself by using the biological fluids. The biological fluids may include but not limited to blood glucose, blood serum, gastric juice, blood and any body heat and the like. Further the bio membrane 104 includes multiple compartments such as electrodes and diffusion system to contact with bio fluids for producing electricity. The different compartments of the micro battery 102 separated by a biological membrane 104 such as silicon rubber or diaphragm and the like. The micro battery 102 further includes a cylindrical housing and a diaphragm welded to seal the different compartments of the micro battery 102. Also, in some embodiments, the can or walls of the micro battery 102 can be three-dimensional shape which may include but not limited to a cube, a cuboid, a pyramid, a cone, a hemisphere, and octahedron and the like. The electrodes are independent from the different compartments of the micro battery 102.

[0026] Also as shown in Figure 1, in some other embodiments, the micro battery 102 positioned in the human body is made of biocompatible and inert materials. In some preferred embodiments, the micro battery 102 is one of voltaic cells that generates electricity on the standard principle of bio compatible compartment 106 also referred as a primary compartment. The bio compatible compartment 106 configured to store a chemical substance which may include but not limited to a acidic solution or sugar solution mainly including hydrochloric acid, small quantities of potassium chloride and sodium chloride, or sugar/glucose and the like used as the electrolyte. Also in some embodiments, the bio compatible compartment 106 filled with acid and also a refill electrolyte is supplied through bio membrane coupled with a balloon nipple 116 using external injection device. In some embodiments, the biocompatible compartment 106 refueled by directly swallowing biological acid juices which may include but not limited to a lemon juice, orange juice, pineapple juice, and any other sour juice and the like. The refillable balloon nipple 116 made of biocompatible silicon rubber to inject the solution externally and also the repeated injections of silicon rubber balloons do not hamper the body. In some other embodiments, the biocompatible compartment 106 is refueled with the biological acid juices through intravenous therapy by infusing the predefined chemical substance into body. Also in some embodiments, the biocompatible compartment 106 is refueled with the biological acid juices by using skin patch, feet bath and the like processes to infuse predefined chemical substances into body.

[0027] In some preferred embodiments, the electrodes coupled to the bio compatible compartment 106 are made of Platinum (Pt) and Zinc (Zn) and are employed as the anode and the cathode. In some other embodiments Tantalum (Ta) and carbon are used as cathode and anode respectively by considering the biocompatibility and the standard potential of the micro battery 102. The chemical reactions used for generating electricity, Platinum does not dissolve and Zinc dissolves slightly as represented in equations (1).

$(-)\ Zn \rightarrow Zn^{2+} + 2e^-$

$(+)\ 2H^+ + 2e^- \rightarrow H_2$............. (1).

[0028] The Zn is the essential trace metal and safe for humans and Pt is safe as well and importantly, is active at the reduction of hydrogen ion, which prevents the polarization, a critical issue of voltaic cell. In some embodiments, the theoretical voltage of the micro battery 102 is calculated as 1.92 V from the standard electrode potential of Pt and Zn, which is greater than that of the conventional voltaic cells utilizing copper and zinc as the anode and the cathode, respectively. In some other embodiments, the Polydimethylsiloxane (PDMS), which is a thermosetting polymer, is used for the casing, which is a biocompatible polymer and has been widely used to form micro structures. This is formed by sandwiching the porous ceramics between the electrodes to filter foreign materials, spread and, more importantly, to hold the gastric fluid. Titanium (Ti) and subsequently, Pt is evaporated on a thin glass plate to form the anode. The Ti works as a contact metal to enhance the adhesion of Pt to the glass. The metals could not be deposited onto PDMS directly since the deposition involves heat and generates cracks in the Pt film on the PDMS. A thin Zn plate is used as the cathode. We used Fine Porous Ceramics as the filter. The electrodes and the filter are sandwiched by the PDMS casing, which are bonded via surface activation by oxygen plasma.

[0029] Also further as shown in figure 1, the biocompatible compartment 106 is electrically connected with a processor 110 through power connection ports 108. The processor 110 positioned in the micro battery 102 is micronized in size and transmit instructions to the other biological fuels compartments automatically by its robotic memory in an intellectual style. The processor 110 includes a wireless transceiver 112 and a global positioning system chip for receiving GPS signals to locate/track the micro battery 102. The wireless transceiver 112 is used to receive data from and transmit data to the authenticated portable devices outside the body, where the portable device may include but not limited to a mobile device, tab, or any electronic equipment and the like used to operate the bio-medical implants.

[0030] In some preferred embodiments, the processor 110 performs multiple functions within the micro battery 102. The multiple functions may include but not limited to updating, storing and executing operations and applications and the like. The processor 110 also includes a memory and other necessary features to perform the above mentioned functionalities. In some preferred embodiments, the processor 110 and transceiver 112 may work in conjunction for external technological communication through satellite. The processor 110 can control communications transmitted and process communications received through transceiver 112, such transmissions may include instructions to processor 110 or data sent by processor 110. The wireless transceiver 112 transmits the data to the externally placed portable devices. In some embodiments, the processor 110 can turn off/turn on the compartments of micro battery 102 at certain intervals to ensure constant power, externally/remotely.

[0031] In some other preferred embodiments, the actual processor 110 placed inside the micro battery 102 holds the important information, as well as a tuning capacitor and an antenna coil. The capacitor receives power and transmits it to the portable device downloaded with the specific application. The microchip's information can then be picked up through the antenna, which is a copper coil. The micro battery 102 transmits radio signals to the portable device with the authenticated identification number. The application can then interpret the radio waves and display the code number and translates the displayed code as message.

[0032] Also further as shown in Figure 1, the micro battery 102 includes one or more bio fuel compartments 114a, 114b and 114c used to store their respective bio-fuels such as blood fuel, glucose fuel, microbial fuel and the like without limiting the scope of the disclosure for generating electrolyte and create a conductive path for electrons emitted by electrodes. In some embodiments the bio fuel compartment may include but not limited to a blood fuel cell 114a used to generate electrolyte by the blood. In some embodiments, the bio fuel compartment may include a glucose fuel 114b used to generate electrolyte by the glucose included in the body fluid. In some other embodiments, the bio fuel compartment may include a microbial fuel compartment 114c used to generate electrolyte by combining the microbial fuel compartment 114c and use micro-organisms to transform bio convertible substrates directly into electricity.

[0033] In some embodiments, the bio fuel compartments 114a, 114b and 114c consists of a platinum catalyst that strips electrons from glucose, mimicking the activity of cellular enzymes that break down glucose to generate ATP, the cell's energy currency. The bio fuel compartments 114a, 114b and 114c may generate power upto hundreds of microwatts enough to power an ultra-low-power and clinical implant. Further the micro battery 102 also includes a multipurpose compartment 118 used as an implant, or a drug reservoir or any other circuit positioned to connect with general electrical mechanisms.

[0034] FIG. 2 is a diagram 200 illustrating an exemplary preferred embodiment of plurality of compartments used to generate power. According to a non limiting preferred embodiment of the present disclosure, the plurality of compartments included in the micro battery used to generate electricity by the different body fluids collected in the specific compartments. The micro battery surgically implanted in the human body is positioned between the stomach flesh 224 and intestine flesh 222. For convenience the present disclosure describes only about the positioning of the micro battery between the stomach flesh 224 and intestine flesh 222. However it should be understood that the positioning of the micro battery is not limited to stomach flesh 224 and intestine flesh 222, it can be positioned in any part of the human body in consistent with the disclosed embodiments.

[0035] As shown in Figure 2, the biocompatible membrane 206 configured to store a chemical substance which may include but not limited to a acidic solution or sugar solution mainly including hydrochloric acid, small quantities of potassium chloride and sodium chloride, or sugar/glucose and the like used as the electrolyte. Also in some embodiments, the bio compatible compartment 206 filled with acid and also a refill electrolyte is supplied through bio membrane coupled with a balloon nipple using external injection device. In some embodiments, the biocompatible compartment 206 refueled by directly swallowing biological acid juices which may include but not limited to a lemon juice, orange juice, pineapple juice, and any other sour juice and the like. The electric power generated by the chemical substances stored in the biocompatible membrane 206 is moved through an electrode 220a positioned at the top of the micro battery and coupled with flesh of the stomach 224.

The power extracted from the respective electrode 220a creates a conductive path for electrons emitted by the electrodes to operate the bio-medical implant devices.

[0036] Also as shown in Figure 2, in some embodiments, a blood fuel compartment 214a is included in the bio-membrane to recharge the micro battery by itself from blood stream. In this current process, the body heat is used as a power source for micro battery and further used as a power supply for the entire body. As the body temperature differs in different places of the body, the biocompatible compartment 206 of the micro battery provide a power backup to maintain the constant power supply through the instruction of the processor controlled by the portable device application. In some embodiments, energy gradient provides the power flow to the compartments of the micro battery. Also in some embodiments, in case of blood clot or arteriosclerosis, the micro battery may not receive the required power and in some cases, if anything blocks the electrodes to access the blood, then also the power cannot be generated. Thus, in such cases the biocompatible compartment 206 works as a backup and the micro battery receives power from the current flow between electrodes. In some embodiments, the biocompatible compartment 206 referred as a voltaic cell or acidic cell. In fuel compartments, the power is generated by causing a chemical reaction at controlled rate and by burning blood chemicals from blood cells of the human body. The electrode 220b of the blood fuel compartment 214a is coupled with flesh of the stomach to create a conductive path for the electrons emitted by the electrode 220b for operating the bio-medical implant devices.

[0037] Further as shown in Figure 2, in some embodiments, glucose-fuel compartment 214b of the micro battery consists of two electrodes, anode and cathode. The anode is coated by a mediator which is intern coated with a sugar digesting enzyme layer. The cathode also has an analogous construction, but in the present disclosure the mediator is covered by oxygen reducing enzymes. The electrode 220c of the glucose fuel compartment 214b is coupled at the flesh of the stomach to create a conductive path of electrons emitted by the electrodes for operating the bio-medical implants. The two electrodes are placed on either side of a cellophane separator. The enzymes at the anode break down glucose molecules into gluconolactone, hydrogen and electrons.

Glucose Gluconolactone + 2H+ + 2e-

[0038] The hydrogen ions move towards the cathode through the separator while the electrons follow the external path (conductor) to reach the cathode. The enzymes at the cathode reduce oxygen with the electrons causing it to combine with the Hydrogen ions to form water.

O2 + 4H+ + 4e- 2H2O

[0039] Thus, the movement of electrons (current) generates a voltage across the load for further producing power. It could be medically important to note that these reactions can take place in a neutral solution because enzymes are selective in nature. There is no cross reaction between the two electrodes unlike in the processes that occur in the biocompatible compartment using lemon juice as chemical substance. The enzymes and mediators held in position on the electrodes are hold by a cross-linked enzyme clusters on carbon nanotubes. The hydrogen ions will still find their way to the cathode. In some embodiments, the glucose fuel compartment including sugar is has an energy storage density of 596 amp-hours per kilo higher than lithium-ion batteries. This fuel compartment is refillable with a solution of maltodextrin, and generates the by-products of electricity and water.

[0040] Also further as shown in Figure 2, in some embodiments, microbial fuel compartment 214c included in the micro battery uses micro-organisms to transform bio convertible substrates directly into electricity. The bacterium in the micro-organisms is used as anode and the electrons flow from the cathode through a resistor. The anode and cathode of the electrode 220d is positioned at the intestine flesh 222. The catalytic actions of the micro-organisms have been used to produce electrical output from the different carbohydrates and complex substrates. In above mentioned glucose fuel compartment 214b, the power output produced is in the range of 50 μW, sufficient to supply a cardiac pacemaker. Both glucose and oxygen present in the compartment 214b and tissue of all eukaryotic organisms which may include but not limited to human beings. The fuel compartment receives the support from the body's own resources which may include but not limited to the metabolic properties of our cells and the like to generate enough energy for powering an array of clinical implant devices, including drug delivery systems, diagnostic tools, and human augmentation devices and the like. Also, the catalytic reactions of microorganisms produce electrical output from different carbohydrates and complex substrates up to 50uW range sufficient to run a pacemaker.

[0041] Though not depicted in Figure 2, in some embodiments, enzymes fuel compartment included in the micro battery uses the motor enzymes which may include but not limited to inesin, RNA polymerase, myosin, and Adenosine tri-phosphate (ATP) synapse and the like. The motor enzymes are fuelled by ATP molecule including adenine, ribose, and three phosphate groups that are linked by covalent bonds. Among the three phosphate groups, the first phosphate group signaled by coenzyme is removed and a large amount of energy is released in the form of a reaction product called adenosine diphosphate (ADP). Thus in further requirement of energy, the second phosphate group is released to create adenosine monophosphate (AMP). The energy created is made available to be used for chemosynthesis, locomotion (including muscle contraction in animals), and the active transport of ions and molecules across cell membranes. Thus the ATP molecule is refueled by the rephosphorylation of ADP and AMP using the chemical energy generated from the oxidation of food and used to recharge micro battery fuels.

[0042] Also further as shown in Figure 2, a wireless transceiver 212 referred as a light emitting diode coupled with the bio fuel compartment 214b through a coil to transmit and receive data from the any of the portable device. The portable device may include but not limited mobile device, tablet, laptop, and any other portable device and the like.

[0043] FIG. 3 is a diagram 300 illustrating an exemplary preferred embodiment of a closed container implanted in a human body. According to a non limiting exemplary preferred embodiment of the present disclosure, the biocompatible micro battery placed inside a container 326 positioned in any part of the human body. For example in figure 3, the disclosure depicts the positioning of the container in stomach to which the internal flesh 324 and interior of the external flesh 324 is surrounded. Also electrodes 328 extending from the container 326 of the micro battery connect with the internal flesh 324 of the stomach. The connected electrodes 328 receives the power generated by the multiple fuel compartments included in the micro battery and creates a conductive path of electrons emitted by the electrodes for operating the bio-medical implant devices.

[0044] As shown in Figure 3, the different fuel compartments included in the micro battery acts according to their necessity. For example, in case of unavailability of required amount of glucose in the body levels of the glucose fuel compartment, the micro battery receives power from the any other compartments such a microbial fuel compartment or blood fuel compartment. Similarly, in the unavailability of fuel in any of the compartment, the one or the other compartment is activated to generate power and recharge the battery by itself and operate the bio-medical implant devices.

[0045] FIG. 4 is a diagram 400 illustrating an exemplary preferred embodiment of establishing a communication with a portable device. According to a non limiting exemplary preferred embodiment of the present disclosure, the micro battery placed inside a container 426 and positioned in any part of the human body as mentioned in above figure 3. The micro battery establishes a wireless communication 432 with a portable device 430 which may include but not limited to a mobile device, laptop, tablet and any other portable device and the like.

[0046] As mentioned in above Figure 1, in some embodiments the wireless transceiver positioned in the micro battery is used to transmit and receive data from the portable device 430. For convenience the present is depicting only about a mobile device 430 for communication. However it should be understood that in general there may be any other portable device such as laptop, tablet, personal computer and the like used as similar as the mobile device 430. Therefore the present disclosure is not limited to the usage of mobile device for establishing a communication with the micro battery.

[0047] In some embodiments, the micro battery placed in the container 426 establishes a wireless communication 432 with the portable device 430 also referred as a mobile device. The wireless communication 432 included in the present disclosure may include but not limited to RFID, Zig bee, Wi-Fi, Li-Fi and the like.

[0048] FIG. 5 is a flow diagram 500 illustrating an exemplary method of self chargeable bio-fueling micro battery. According to a non limiting exemplary preferred embodiment of the present disclosure, the method of self charging the micro battery starts at step 502 by diffusing a bio-membrane by plurality of bio-fluids for charging. The bio-fluids may include but not limited to blood glucose, blood serum, gastric juice, blood and any body heat and the like.

[0049] As shown in Figure 5, at 504 the plurality of bio medical implant devices are operated by at least one of chemical substance stored in a bio-compatible compartment. The chemical substance may include but not limited to a acidic solution or sugar solution mainly including hydrochloric acid, small quantities of potassium chloride and sodium chloride, or sugar/glucose and the like used as the electrolyte. Next at 506, the bio-fuels stored in multiple bio fuel compartments are used for generating electrolyte and create a conductive path for electrons emitted by electrodes. The bio-fuels may include but not limited to blood fuel, glucose fuel, microbial fuel, enzyme fuel and the like. Further at 508, a processor in communication with the biocompatible compartment through plurality of connectors interfacing with the multiple bio fuel compartments used to control communication between the user authenticated with the portable device and bio medical implant device.

[0050] While specific embodiments of the disclosure have been shown and described in detail to illustrate the inventive principles, it will be understood that the disclosure may be embodied otherwise without departing from such principles.

[0051] FIG. 6 is a diagram 600 illustrating glucose sensors for measuring a level level of glucose in the blood with an exemplary preferred embodiment. The diagram 600 depicts a glucose sensor may configured to detect the levels of glucose concentrations in a body compartment or tissue 604. The glucose sensor may design to work based on an oxidation of glucose, catalyzed by the enzyme glucoseoxidase. A hollow fiber 601 is used to position a glucose sensor in a required position on the tissue 604. The glucose diffused from the tissue 604 into the hollow fiber and reacts with oxygen electrode 602 then catalyzed by the enzyme and a potentiostate 610. The potentiostate 610 may configured to controls the voltage difference between a working electrode and a reference electrode which are contained in an electrochemical cell.

[0052] In some embodiments, the potentiostate 610 controls the voltage difference by injecting current into the electrochemical cell through an auxiliary or counter electrode for measuring the current flow between the Working and counter electrodes. The glucose sensor may configure to function in independent of blood/tissue concentration and recirculation enzyme solution equilibrates with the environmental oxygen concentration before reuse. The oxygen concentration is determined by the oxygen electrode. A polysulfone hollow fiber membranes used for collecting the blood which is passing through a system. The polysulfone hollow fiber with a predetermined measurements such as internal diameter 0.5 mm, outer diameter 0.8 mm, length 5 cm used for collection of blood passing through the system without limiting the scope of the disclosure.

[0053] As shown in Figure 6, the hollow fiber 601 may inserted into artery and on the both ends to polyethylene connecting tubes 603 which are sealed tightly at the ends. The polyethylene connecting tubes 603 possess a predetermined diameter and predetermined length such as internal diameter 0.4 mm, outer diameter 0.8 mm. Charcoal samples 606 acquire with a filtrate collector 608 which is absorbed by the cell/artery automatically as body diffusion mechanism. Then the glucose isolated from the blood samples through a hollow fiber micro dialysis unit. An Enzyme reservoir 605 contains a required solution for conversion into fuel and charcoal. Micro dialysis unit is inserted with the hollow fiber 601. Further a LED 607 may configure to explain the diagram that produced electricity. A micro battery 609 is an embodiment and placed in the multi-compartment to enhance the system soothing and collect charcoal for the people with diabetes and gastric diseases.

CLAIMS

What is claimed is:

1. A self chargeable bio-fuelling micro battery, comprising:

a bio-membrane configured to diffuse by plurality of bio fluids for charging, whereby the bio-membrane comprising:

a biocompatible compartment storing at least one of chemical substance configured to operate plurality of bio-medical implant devices;

one or more bio fuel compartments configured to store bio-fuels for generating electrolyte and creating a conductive path for electrons emitted by electrodes; and

a processor in communication with the biocompatible compartment through plurality of connectors interface with the one or more bio fuel compartments to control the communication between user and the bio medical implant devices.

2. The micro battery of claim 1, wherein a transceiver positioned in the processor configured to receive global positioning signals for locating; and tracking the micro battery.

3. The micro battery of claim 1, wherein the one or more bio fuel compartments separated by a biological membrane used for sealing.

4. The micro battery of claim 3, wherein the biological membrane used for sealing comprising a silicon rubber; and diaphragm.

5. The micro battery of claim 1, wherein a wireless or global positioning system utilizes the processor and the transceiver for receiving global positioning system signals to locate; and track the micro battery receive data and adjust settings in the micro battery.

6. The micro battery of claim 1, wherein the at least one of chemical substance stored in biocompatible compartment comprising acid solutions; sugar solution including hydrochloric acid; potassium chloride; sodium chloride; sugar; and glucose.

7. The micro battery of claim 1, wherein the one or more bio fuels comprising blood fuel cell; glucose fuel cell; and microbial fuel cell.

8. The micro battery of claim 7, wherein the one or more bio fuels receives electrolyte from abdomen and microbes from intestine to form fuel.

9. The micro battery of claim 1, wherein the processor maintains constant power supply for the bio medical implants.

10. The micro battery of claim 1, wherein the processor provides plurality of instructions to the one or more bio fuel compartments automatically by an inbuilt memory in an intellectual style.

11. The micro battery of claim 1, wherein the processor turns on/off automatically by recharging the one or more bio fuels compartments.

12. The micro battery of claim 1, wherein the processor turns on the bio membrane in the absence of the availability of fuel in the one or more bio fuel compartments.

13. The micro battery of claim 1, wherein the bio compartment refueled by directly swallowing biological acid juices comprising lemon juice; orange juice; pineapple juice; and sour juice.

14. The micro battery of claim 1, wherein the bio compartment refueled by in gestation of food.

15. The micro battery of claim 1, wherein the bio compartment refueled by directly refillable balloon nipple through three dimensional catheters.

16. The micro battery of claim 14, wherein the refillable balloon nipple formed by a biocompatible silicon rubber.

17. The micro battery of claim 1 wherein a tuning capacitor included in the processor receives power from the one or more bio fuel compartments and transmits to authenticated portable device.

18. The micro battery of claim 1, wherein the transceiver collects the global positioning system chip information and transmits to the portable device.

19. The micro battery of claim 1, wherein radio signals transmitted to the portable device with a unique identification number.

20. The micro battery of claim 1 wherein an application downloaded in the portable device interprets the radio signals and displays the code number and translates the code to a message.

21. The micro battery of claim 1, wherein the transceiver establishes a wireless communication with a portable device through plurality of wireless communication technologies.

22. The micro battery of claim 1, wherein one or more therapies configured to infuse plurality of chemical substances into human body to recharge the micro battery.

23. The micro battery of claim 1, wherein intravenious drip configured to infuse plurality of chemical substances into human body to recharge the micro battery.

24. The micro battery of claim 1, wherein chemical infused patches configured to infuse a plurality of chemical substances into human body to recharge the micro battery.

25. The micro battery of claim 1, wherein chemical baths infuse a plurality of chemical substances into human body to recharge the micro battery.

26. The micro battery of claim 1, wherein titanium configured to decrease rejection of body tissue thruosseoin generation.

27. The micro battery of claim 1, wherein the electrodes positioned in a vein to use the glucose as a fuel.

28. The micro battery of claim 1, wherein the additional part of the glucose fuel chamber placed in the multi-purpose compartment configured to filter charcoal for maintaining required fuel to run a device.

29. The micro battery of claim 1, wherein a glucose monitoring chamber configured to burn excess glucose in blood.

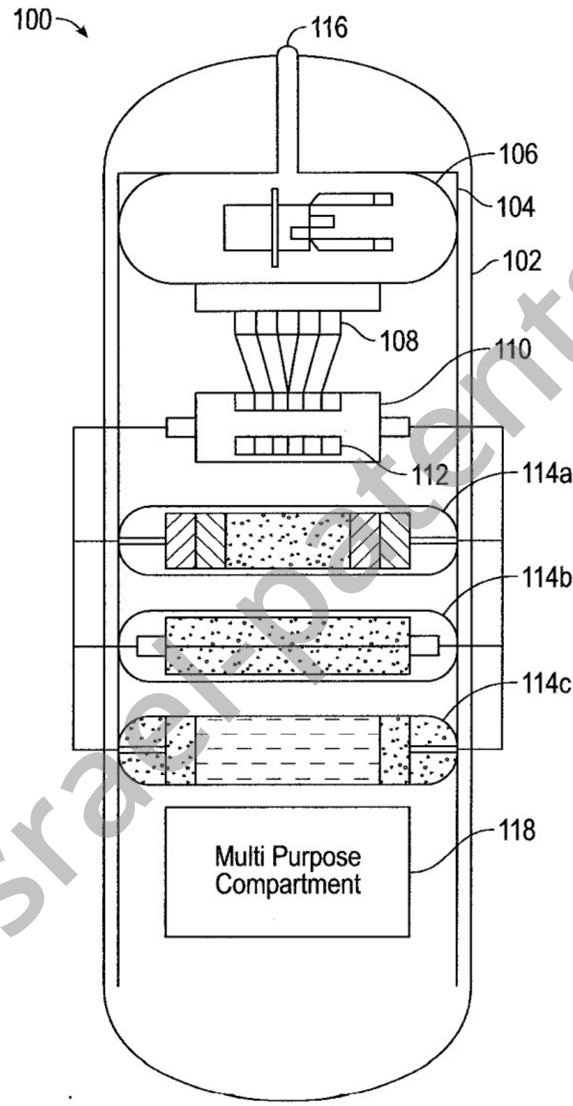
30. A method for self charging bio-fuelling micro battery, the method comprising:

diffusing a bio- membrane by plurality of bio fluids for charging, whereby the bio membrane comprising:

operating plurality of bio-medical implant devices by at least one of chemical substance stored in a biocompatible compartment;

storing bio-fuels in one or more bio fuel compartments for generating electrolyte and creating a conductive path for electrons emitted by electrodes; and

controlling communication between user and the bio-medical implant devices by a processor in communication with the biocompatible compartment through plurality of connectors interfacing with the one or more bio fuel compartments.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116
106
104
102
108
110
112
114a
114b
114c
118
Multi Purpose Compartment

FIG. 1

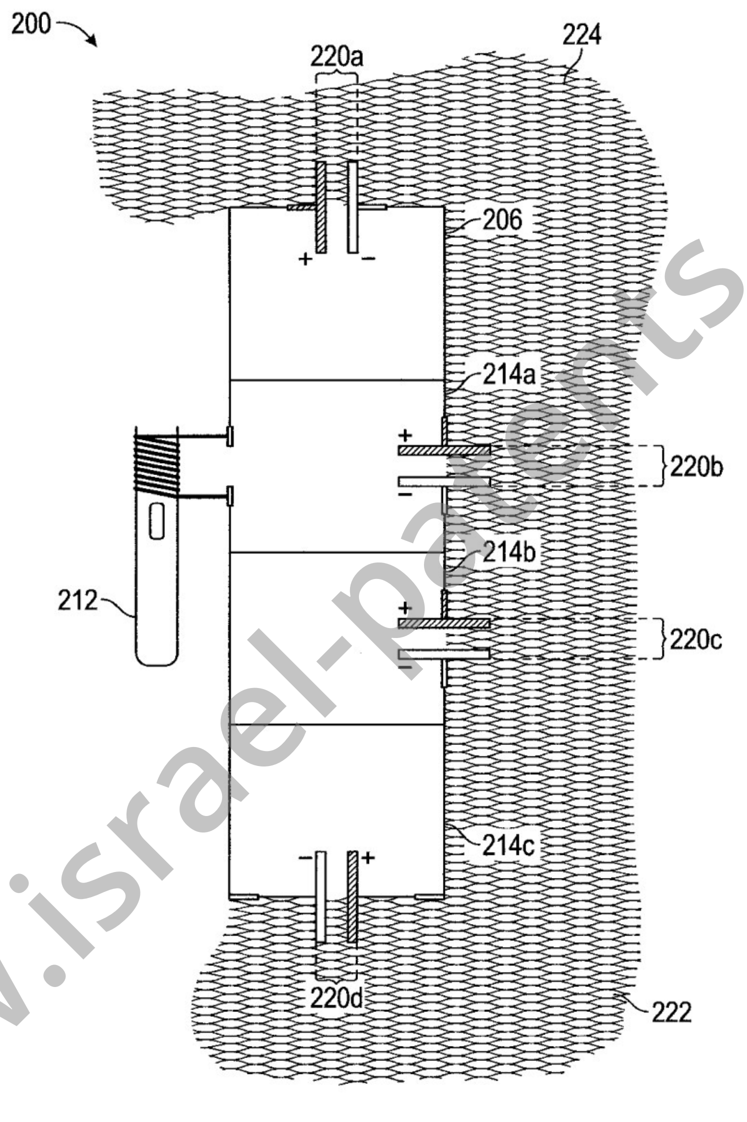

FIG. 2

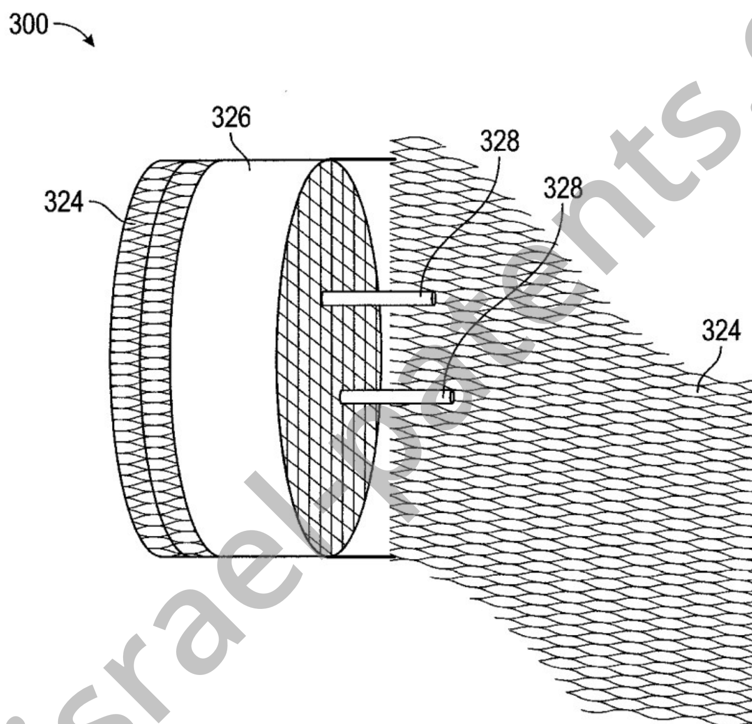

FIG. 3

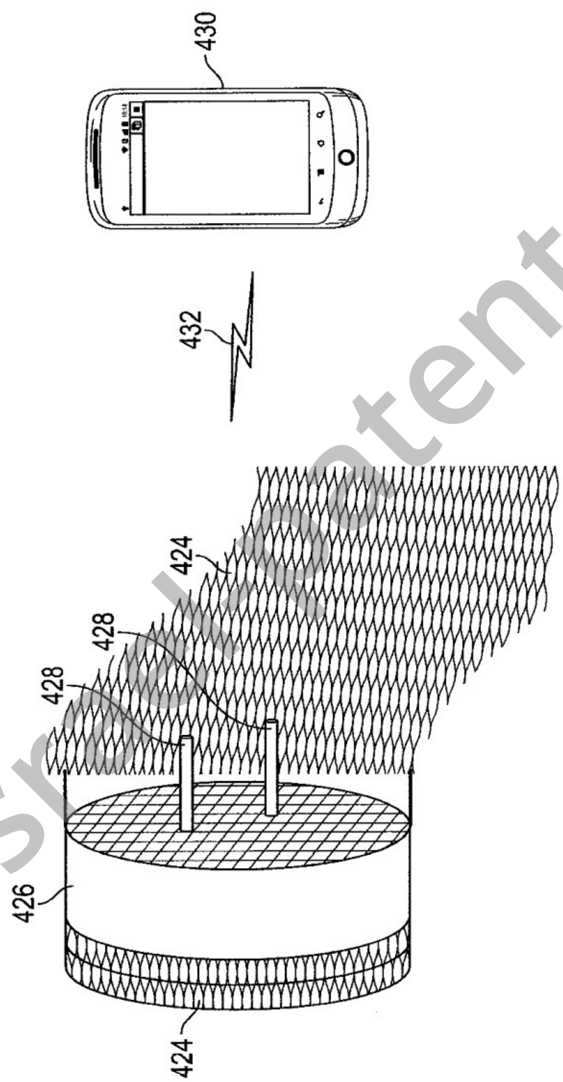

FIG. 4

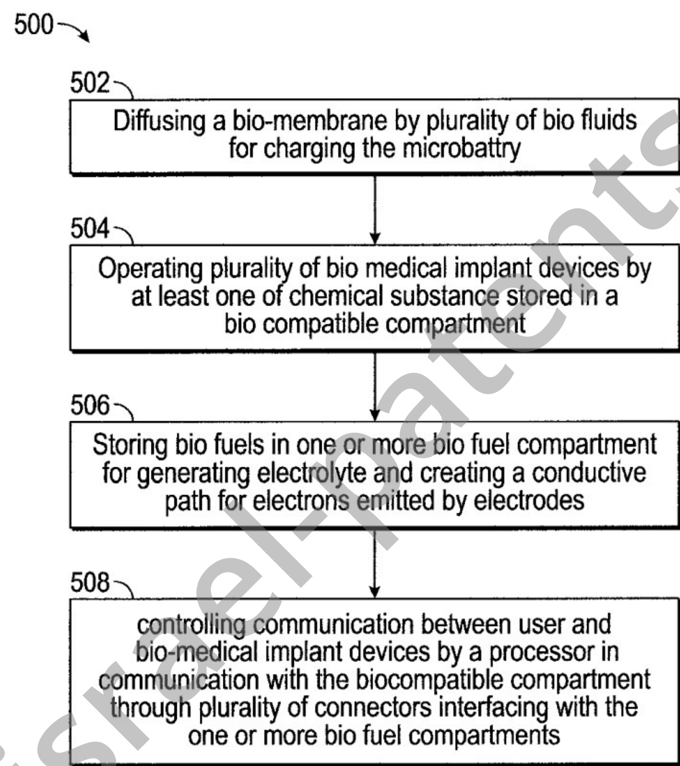
500
502
Diffusing a bio-membrane by plurality of bio fluids for charging the microbattry
504
Operating plurality of bio medical implant devices by at least one of chemical substance stored in a bio compatible compartment
506
Storing bio fuels in one or more bio fuel compartment for generating electrolyte and creating a conductive path for electrons emitted by electrodes
508
controlling communication between user and bio-medical implant devices by a processor in communication with the biocompatible compartment through plurality of connectors interfacing with the one or more bio fuel compartments

FIG. 5

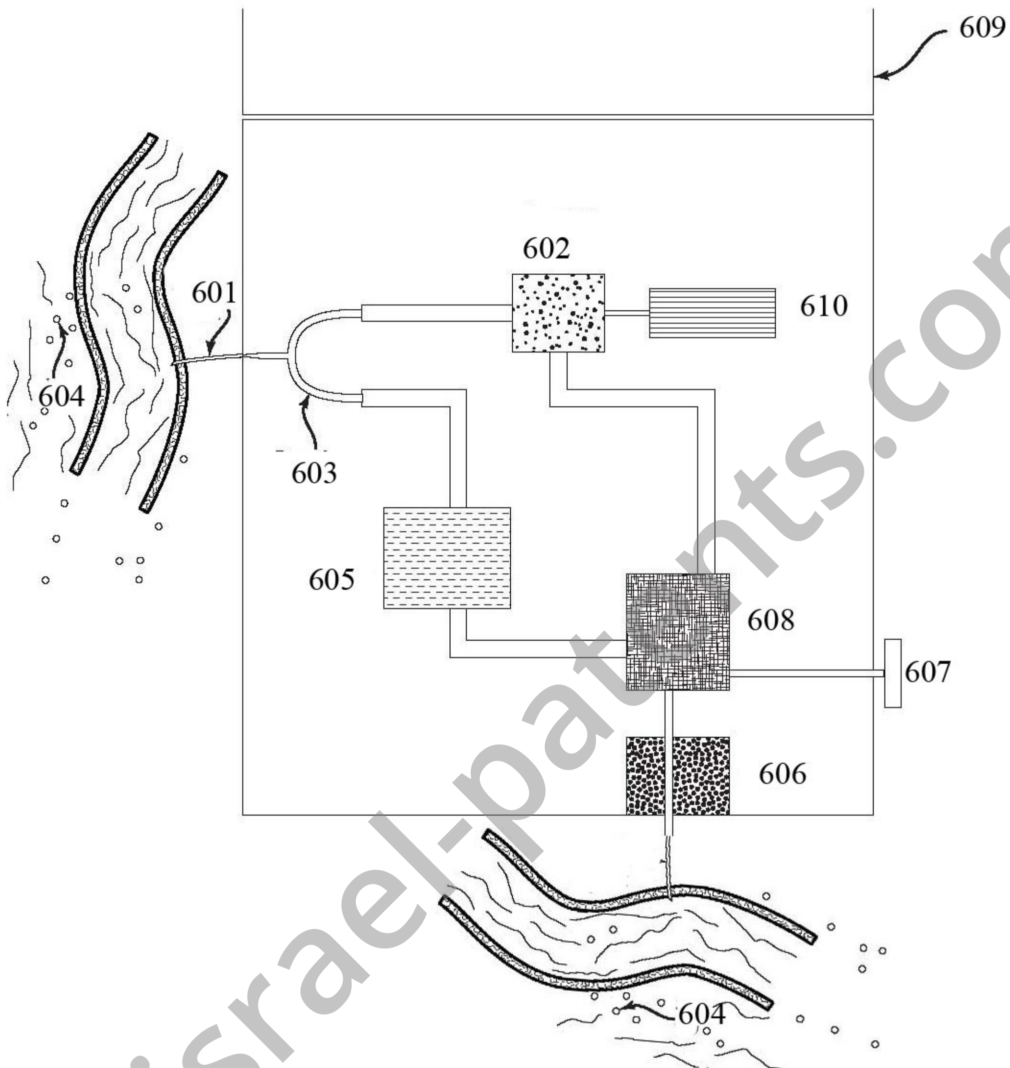

FIG. 6