CONSTANT MICRO POWER ENERGY SYSTEM (CMPES) DEVICE

RELATED APPLICATIONS AND CLAIM FOR PRIORITY

[0001] The present application claims priority to U.S. Non-Provisional Patent Application No. 18/213,270, filed June 23, 2023; which claims the benefit of U.S. Provisional Application No. 63/355,598, filed June 25, 2022; all of which is incorporated herein in its entirety and referenced thereto.

TECHNICAL FIELD

[0002] The present disclosure relates to cylindrical disc flux generators, and in particular, relates to a constant micro power energy system (CMPES) device designed to harness sustainable energy sources and generate power while maintaining zero carbon emissions.

DESCRIPTION OF THE RELATED ART

[0003] The depletion of non-renewable energy sources, including coal and oil, has led to a global energy crisis. The global energy crisis has prompted a growing need for alternative and renewable energy sources to meet the increasing demand for power. Among the renewable energy sources, wind power has emerged as a promising solution. Wind turbines have become a prevalent technology for harnessing wind energy and converting it into electricity. However, despite their widespread use, existing wind turbines face various limitations that hinder their optimal performance and efficiency. Addressing these limitations is crucial to fully unlock the potential of wind power and ensure a sustainable energy future. Traditional wind turbines face a significant drawback in their performance, particularly in low wind conditions. The wind turbines have a minimum wind speed requirement to initiate electricity generation, rendering them ineffective when wind speeds are insufficient. As a result, consistent and reliable electricity generation from the wind turbines becomes challenging, especially in regions with lower wind speeds.

[0004] In addition, devices that utilize renewable energy, hereinafter referred as renewable energy devices, often grapple with sustainability and storage limitations. For instance, solar and wind power heavily rely on favorable weather conditions, and the captured energy needs to be stored for future use. Unfortunately,

unfavorable weather conditions can disrupt power generation, and the cost of storage batteries can be prohibitively high. These constraints pose obstacles to the widespread adoption of renewable energy sources, hampering progress toward a more sustainable future.

[0005] Some of the renewable energy systems have been disclosed in the past. An example is disclosed in a United States Patent No. 5,384,489, entitled "Wind-powered electricity generating system including wind energy storage" ("the '489 Patent"). The '489 Patent discloses a wind-powered electricity generating system including a wind energy storage and recovery device. The wind energy storage and recovery device include a wind-powered electricity generator (not necessarily a system of the invention), a heater operable with electricity from the generator, thermal fluid heated by the heater, a tank to store the heated fluid, and a stored heat energy extractor. In addition to the storage and recovery device, the system of the invention also includes blades mounted to rotate a shaft of a wind-powered generator in response to the wind to create electricity, and switch means actuable in response to the amount of electricity created by the generator for applying electricity to the heater. In another aspect the invention relates to a method for storing wind energy.

[0006] Another example is disclosed in a European Publication No. 1,577,549, entitled "Apparatus for storing thermal energy and generating electricity" ("the '549 Publication"). The '549 Publication discloses a system for storing thermal energy, comprising a heat storage device with a heat storage medium operating between a lower and a higher temperature level, a first heat generating means comprising an electrical resistor inside the heat storage device for heating the heat storage medium with electrical power, a first heat transfer means for transferring thermal energy from the heat storage device to a thermodynamic machine for generating electricity,

[0007] Traditional wind turbines and other renewable energy devices with storage systems suffer from a notable limitation, i.e., limited power output. Traditional wind turbines usually employ a configuration of two or multiple blades connected to a central shaft and generator. The design constraint restricts the potential energy generation capacity of the turbine and poses challenges in maximizing the efficient capture of wind energy. As a result, there is a need for innovative solutions that can

overcome these limitations and enable higher power output while optimizing the utilization of wind energy resources.

[0008] Moreover, traditional wind turbines and most renewable energy systems are often burdened with high manufacturing, installation, and maintenance costs. Traditional wind turbines and renewable energy systems demand specialized equipment and skilled labor, rendering them costly and inaccessible for numerous communities, particularly in developing countries. The expense associated with acquiring and maintaining renewable energy solutions hampers their widespread adoption and impedes progress towards achieving sustainable and affordable energy access for all.

[0009] Consequently, there is a need for innovative approaches that address these cost-related challenges and facilitate the deployment of renewable energy technologies on a broader scale. To overcome these limitations, there exists a demand for a groundbreaking electric energy generator that can effectively produce electricity across various conditions, exhibit a high power output, and offer cost-effective manufacturing, installation, and maintenance processes.

SUMMARY

[0010] It is an object of the present invention to provide a constant micro power energy system (CMPES) device designed to harness sustainable energy sources and generate power while maintaining zero carbon emissions and that avoids the drawback of known wind turbines and other renewable energy devices.

[0011] It is another object of the present invention to provide an efficient and reliable solution for electricity generation that surpasses the constraints of existing technologies and also facilitates the widespread adoption of sustainable power sources.

[0012] In order to achieve one or more objects, the present invention provides a constant micro power energy system (CMPES) device to harness sustainable energy sources and generate power. The CMPES device includes a main body structure having a base plate, a frame extending from the base plate, and a top plate positioned at the top of the frame. The CMPES device includes a flask barrel positioned in the frame and motors positioned on the top plate. The CMPES device includes a ring gear connecting the flask barrel and a motor shaft of each motor. The

ring gear has 150 helically shaped teeth, with an outer diameter of 803.2 mm, and an inner diameter of 596 mm. The ring gear provides speed reduction and torque increase. The CMPES device includes disc generators positioned inside the flask barrel. In one example, five disc generators are inserted inside the flask barrel. The disc generators are constructed from high-quality aluminum parts. The motors supply power to drive the flask barrel to rotate constantly at a predetermined speed in order to generate continuous electrical power output. The motors facilitate direct transmission to the disc generators in order to provide the electrical power output to panel systems connected to the CMPES device.

[0013] In one aspect, the motors include six-geared motors positioned on the top plate. Each motor is directly splined to a helical gear having 27 teeth with an outer diameter of 149.7 mm. Each motor is configured to deliver a power output of 0.075 kW to 1.1 kW. In one implementation, two or more motors (preferably three motors out of six motors) are configured to be in an active state and remaining motors are configured to be in a resting state. The motors in the active state are configured to deliver a combined power output of 2.25 kW to rotate the flask barrel constantly. In the present invention, three of the six motors are switched selectively and operated to generate a combined power output of 2.25 kW to rotate the flask barrel constantly. Each of three motors has a minimum power output of 0.75 kW per motor and three motors are used to achieve the flask barrel speed of 250 rotations per minute. Here, each motor presents a Nominal torque of one motor is 4.95 (Newton meter) Nm while its max (peak) torque is 12.7 Nm. In one example, a motor with a power output of 1.1 kW is utilized at 83% capacity during the initial acceleration stage and 32% capacity during nominal operation.

[0014] In another aspect of the present invention, the CMPES device includes a perforated sheet metal protective fence securely placed on twelve distance rings, ensuring a safe distance from the motor drive gear and the machine ring gear. Further, the CMPES device includes two half-circle sheet metal decorative panels encapsulating the bottom side of the main body structure. Furthermore, the CMPES device includes a cover cap made from PA6 plastic, designed for easy insertion onto the main barrel flask, featuring a flange for convenient opening and closing.

[0015] In yet another aspect of the present invention, the CMPES device can be used with a hand crank system for turning the disc flux generator to initiate power for the cylinder motors.

[0016] In yet another aspect of the present invention, a single CMPES device can be used for simultaneous AC and DC variant output by One CMPES system device. Here, the AC and DC outputs are provided distinct from one another simultaneously. Such a CMPES device can be used in transportation, aviation and marine vehicles and vessel to ensure seamless and distinct AC and DC outputs.

[0017] In addition. The CMPES device allows to adjust discs to be switched OFF and switched ON without changing the functionality of rotating cylinder. This helps to achieve refinements to ensure a smoother rotation of desired discs. Further, the CMPES device presents an open section with the base. The open section allows the user to insert the flask barrel and disc flux generators thereby providing convenient access for maintenance procedures and disc insertion. Additionally, the unique CMPES device design allows for ambient air flow within the system. The CMPES device design can be optimized for improving air flow efficiency.

[0018] In one advantageous feature of the present invention, the CMPES device presents a compact and efficient solution for harnessing electric energy and generating electricity. By incorporating disc flux generators, the gears, the motors, and optimized barrel shapes, the CMPES device ensures consistent power output in desired kilowatts. The CMPES device presents high power output, portability, low maintenance requirements, environmental friendliness, scalability, and cost-effectiveness. With a capacity to generate up to 100 kW or more, the CMPES device can be implemented in various settings, from residential to commercial and industrial.

[0019] In another advantageous feature of the present invention, the compact and lightweight design of the CMPES device enables easy transportation and installation, making it particularly suitable for remote areas or temporary setups where power is in high demand. Its minimal moving parts reduce maintenance needs, ensuring exceptional durability and longevity. By harnessing electric energy, the CMPES device contributes to the reduction of greenhouse gas emissions and dependence on fossil fuels, providing a clean and sustainable source of electricity. The CMPES device operates with minimal noise. As such, the CMPES device is

suitable for residential areas, and its modular design allows effortless scalability to meet specific power requirements. Its efficient operation, combined with low maintenance needs and the ability to generate power in various conditions establishes the CMPES device as a cost-effective solution for renewable energy generation.

[0020] The features and advantages of the invention here will become more apparent in light of the following detailed description of selected embodiments, as illustrated in the accompanying **FIGURES**. As will be realized, the invention disclosed is capable of modifications in various respects, all without departing from the scope of the invention. Accordingly, the drawings and the description are to be regarded as illustrative in nature.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] The present invention will now be described in detail with reference to the drawings, which are provided as illustrative examples of the invention so as to enable those skilled in the art to practice the invention. Notably, the **FIGURES** and examples are not meant to limit the scope of the present invention to a single embodiment, but other embodiments are possible by way of interchange of some or all of the described or illustrated elements and, further, wherein:

[0022] **FIG. 1A** and **FIG. 1B** illustrate a perspective view and a side view, respectively of view of a constant micro power energy system (CMPES) device, in accordance with one embodiment of the present invention;

[0023] **FIG. 2** illustrates the CMPES device, in accordance with one embodiment of the present invention;

[0024] **FIG. 3** illustrates a perspective view of main body structure, in accordance with one embodiment of the present invention;

[0025] **FIG. 4** illustrates a perspective view of leg, in accordance with one embodiment of the present invention;

[0026] **FIG. 5** illustrates a bottom perspective view of top plate, in accordance with one embodiment of the present invention;

[0027] **FIG. 6** illustrates dowel pins used to press-fit the top plate to a frame, in accordance with one embodiment of the present invention;

[0028] **FIG. 7** illustrates an enlarged view of the dowel pins press-fitted into position between the top plate and a main welded structure, in accordance with one embodiment of the present invention;

[0029] **FIG. 8** illustrates a perspective view of flask barrel, in accordance with one embodiment of the present invention;

[0030] **FIG. 9** illustrates a top perspective view and a cross-sectional view, respectively of the flask barrel, in accordance with one embodiment of the present invention;

[0031] **FIG. 10** illustrates a perspective view of a shaft, in accordance with one embodiment of the present invention;

[0032] **FIG. 11** illustrates a cross-sectional view of the flask barrel having the shaft, in accordance with one embodiment of the present invention;

[0033] **FIG. 12** illustrates the feature of roller bearings connected at the shaft, in accordance with one embodiment of the present invention;

[0034] **FIG. 13** illustrates a perspective view of ring gear, in accordance with one embodiment of the present invention;

[0035] **FIG. 14** illustrates a cross-sectional view of the flask barrel having the ring gear assembled to the shaft, in accordance with one embodiment of the present invention;

[0036] **FIG. 15** and **FIG. 16** illustrate a perspective view and a cross-sectional view, respectively of a motor, in accordance with one embodiment of the present invention;

[0037] **FIG. 17** and **FIG. 18** illustrate perspective views of a disc flux generator, in accordance with one embodiment of the present invention;

[0038] **FIG. 19** illustrates a cross-sectional view of the CMPES device, in accordance with one embodiment of the present invention;

[0039] **FIG. 20** illustrates dowel pins secured to the ring gear, in accordance with one embodiment of the present invention;

[0040] **FIG. 21** illustrates a protective fence, in accordance with one embodiment of the present invention;

[0041] **FIG. 22** illustrates the protective fence strategically positioned using twelve distance rings, in accordance with one embodiment of the present invention;

[0042] **FIG. 23** illustrates a perspective view of decorative panel, in accordance with one embodiment of the present invention;

[0043] **FIG. 24** and **FIG. 25** illustrate a perspective view and a cross-sectional view, respectively of a cover cap, in accordance with one embodiment of the present invention;

[0044] **FIG. 26** illustrates a circuit diagram, in accordance with one embodiment of the present invention;

[0045] **FIG. 27** and **FIG. 28** illustrate tables presenting initiation calculation and selection of motor, in accordance with one embodiment of the present invention;

[0046] **FIG. 29** and **FIG. 30** illustrate tables showing the results obtained based on the initiation calculation, in accordance with one embodiment of the present invention;

[0047] **FIG. 31** and **FIG. 32** illustrate motor characteristics, in accordance with one embodiment of the present invention;

[0048] **FIG. 33** illustrates a table showing input data for gear profile, in accordance with one embodiment of the present invention;

[0049] **FIG. 34** illustrates output calculation and design of the gears, in accordance with one embodiment of the present invention;

[0050] **FIG. 35, FIG. 36, FIG. 37, FIG. 38, FIG. 39, FIG. 40, FIG. 41** and **FIG. 42** illustrate gear profiles, in accordance with one embodiment of the present invention;

[0051] **FIG. 43** illustrates circuit diagram, in accordance with another embodiment of the present invention;

[0052] **FIG. 44** illustrates a cross-sectional view of a CMPES device utilizing a hand crank handle system, in accordance with one embodiment of the present invention;

[0053] **FIG. 45** illustrates a table showing gears and cylinder sizes, in accordance with one embodiment of the present invention; and

[0054] **FIG. 46, FIG. 47, FIG. 48, FIG. 49**, **FIG. 50, FIG. 51** and **FIG. 52** illustrate Pinion and wheel bevel gear (bevel and hypoid gear for 5 kW cylinder barrel) calculations, in accordance with one embodiment of the present invention.

DETAILED DESCRIPTION

[0055] The following detailed description set forth below in connection with the appended drawings is intended as a description of exemplary embodiments in which the presently disclosed invention may be practiced. The term "exemplary" used throughout this description means "serving as an example, instance, or illustration," and should not necessarily be construed as preferred or advantageous over other embodiments. The detailed description includes specific details for providing a thorough understanding of the presently disclosed CMPES device. However, it will be apparent to those skilled in the art that the presently disclosed invention may be practiced without these specific details. In some instances, well-known structures and devices are shown in functional or conceptual diagram form in order to avoid obscuring the concepts of the presently disclosed CMPES device.

[0056] In the present specification, an embodiment showing a singular component should not be considered limiting. Rather, the invention preferably encompasses other embodiments including a plurality of the same component, and vice-versa, unless explicitly stated otherwise herein. Moreover, the applicant does not intend for any term in the specification to be ascribed an uncommon or special meaning unless explicitly set forth as such. Further, the present invention encompasses present and future known equivalents to the known components referred to herein by way of illustration.

[0057] Although the present invention provides a description of a CMPES device, it is to be further understood that numerous changes may arise in the details of the embodiments of the CMPES device. It is contemplated that all such changes and additional embodiments are within the spirit and true scope of this disclosure.

[0058] The following detailed description is merely exemplary in nature and is not intended to limit the described embodiments or the application and uses of the described embodiments. As used herein, the word "exemplary" or "illustrative" means "serving as an example, instance, or illustration." Any implementation described herein as "exemplary" or "illustrative" is not necessarily to be construed as preferred or advantageous over other implementations. All of the implementations described below are exemplary implementations provided to enable persons skilled in the art to make or use the embodiments of the disclosure and are not intended to limit the scope of the disclosure.

[0059] Various features and embodiments of a constant micro power energy system (CMPES) device are explained in conjunction with the description of **FIGUREs (FIGs) 1A-52**.

[0060] **FIG. 1A** and **FIG. 1B** show a perspective view and a side view, respectively of view of a constant micro power energy system (CMPES) device **10**, in accordance with one embodiment of the present invention. Further, **FIG. 2** shows components of CMPES device **10** placed side by side, in accordance with one embodiment of the present invention. CMPES device **10** includes a main body structure **12. FIG. 3** shows a perspective view of main body structure **12.** Main body structure **12** includes a base plate **14** having legs **16.** Base plate **14** comes in a circular configuration. In one example, main body structure **12** includes four legs **16.** Legs **16** connect to base plate **14** using known mechanisms such as welding, fastener, etc. The welded connection ensures a strong and reliable connection between legs **16** and base plate **14** enabling CMPES device **10** to withstand external forces and vibrations.

[0061] **FIG. 4** shows a perspective view of leg **16,** in accordance with one embodiment of the present invention. Leg **16** includes a leg base **18.** Leg base **18** comes in a relatively flat configuration. Leg base **18** includes two leg holes **20.** One leg hole **20** helps to anchor CMPES device **10** to the floor using an anchor screw (not shown) in order to ensure stability during operation. Another leg hole **20** helps to level CMPES device **10** in order to achieve optimal balance and alignment. Leg **16** includes a leg column **22** extending from leg base **18.** In one example, leg **16** has a support member **24** that is welded to leg base **18** and leg column **22.** Support member **24** provides additional support to retain leg base **18** and leg column **22** in position. Further, leg **16** includes a leg connecting plate **26.** Leg connecting plate **26** positions above leg column **22** and connects to base plate **14.** Leg connecting plate **26** has holes **28** for drawing fasteners (not shown) in order to connect to base plate **14.** Legs **16** are designed to securely anchor CMPES device **10** to the floor and adjusted for proper leveling. Legs **16** enhance the overall stability and performance of CMPES device **10** ensuring its efficient operation in various environments.

[0062] Main body **12** has a frame **29** extending upwards from base **14.** Main body **12** includes a top plate **30,** as shown in **FIG. 3.** In one example, top plate **30** is fabricated from durable steel material and undergoes pre-machining processes prior

to assembly. Top plate **30** has a circular rim **31** having six arms **32. FIG. 5** shows a bottom perspective view of top plate **30.** As can be seen, arms **32** extend from circular rim **31.** Each arm **32** includes motor receiving sections **34.** Top plate **30** mounts at the top of a flask barrel **40** (**FIG. 2**). Top plate **30** mounts at the top of flask barrel **40** in a centered position and helps to connect ring gear **42** and six geared motors **44**.

[0063] In order to connect top plate **30** to flask barrel **40,** top plate **30** is fastened using socket screws (not shown). The socket screws ensure a robust and reliable attachment between top plate **30** and flask barrel **40** providing structural integrity to the overall assembly of CMPES device **10**. In addition to the screw fastening, after the assembly process and tightening of the socket screws, four centering dowel pins **46** are press-fitted into position between top plate **30** and the main welded structure. **FIG. 6** shows dowel pins **46** used to press-fit top plate **30** to frame **29.** Further, **FIG. 7** shows an enlarged view of dowel pins **46** press-fitted into position between top plate **30** and the main welded structure. Here, dowel pins **46** enhance the stability of top plate **30** and prevent any potential twisting or rotation of the screws particularly when subjected to excessive torque from motors **44**. This additional measure reinforces the structural integrity and reliability of CMPES device **10** during operation.

[0064] In one implementation, a suitable surface protection treatment is applied on CMPES device **10** to protect the entire structure against corrosion and to ensure its long-term durability. The corrosion-resistant coating safeguards CMPES device **10** from environmental factors and extends its operational lifespan. The constructional features of top plate **30,** fasteners, and dowel pins **46**, CMPES device **10** achieve a robust and secure assembly. The surface protection against corrosion further enhances its longevity, ensuring reliable performance over an extended period.

[0065] **FIG. 8** shows a front view of flask barrel **40,** in accordance with one embodiment of the present invention. Flask barrel **40** includes a cylindrical member **48** having an opening **50** at the top**.** In one example, flask barrel **40** measures 594 mm in diameter and 900 mm in height. Flask barrel **40** measures 584 mm in diameter and 894 mm in height at its internal side. In one example, flask barrel **40** is constructed using three high-grade aluminum parts or other suitable materials

depending on the need. The parts are joined together through Tungsten Inert Gas (TIG) welding. Once the welding process is complete, flask barrel **40** undergoes precision machining to achieve its desired geometrical dimensions and specified tolerances. In one example, flask barrel **40** includes a flask cap **52. FIG. 9** shows a front view of flask barrel **40** having flask cap **52** at the top. Flask cap **52** securely screws onto flask barrel **40** to ensure the integrity of the internal lubrication area encompassing two bearings. Further, flask barrel **40** includes a flask ring **54.** Flask ring **54** mounts around cylindrical member **48,** as can be seen from **FIG. 8**. In one example, flask ring **54** includes holes **56.** Flask ring **54** provides a mounting surface for overall CMPES device **10** and offers additional support for ring gear **42**.

[0066] Inside flask barrel **40**, an additional welded ring **58** is positioned at the topmost point of flask barrel **40,** as shown in **FIG. 8**. Welded ring **58** provides support for a second flask barrel (not shown) and acts as an assembly surface ensuring geometric concentricity, and offering suitable points for secure screwing and fastening of the second flask barrel.

[0067] Flask barrel **40** includes a shaft **60. FIG. 10** shows a perspective view of shaft **60,** in accordance with one embodiment of the present invention. Shaft **60** undergoes precision machining processes to attain the desired geometry, tolerances, and concentricity. Shaft **60** securely attaches to the middle section of flask barrel **40** by screwing it into position. **FIG. 11** shows a cross-sectional view of flask barrel **40** having shaft **60**. Further, shaft **60** includes two tapered roller bearings **64**, strategically positioned at a specific distance from each other. **FIG. 12** shows the feature of roller bearings **64** connected at shaft **60.** Roller bearings **64** play a crucial role in ensuring smooth rotational movement of shaft **60**. To secure roller bearings **64** axially, a KM nut **66** is employed on the top side of shaft **60**, effectively preventing any unintended displacement. To protect the interior of roller bearings **64** from external debris and contamination, a seal **68** is positioned at the bottom of shaft **60**. Seal **68** acts as a barrier, safeguarding the bearing housing from potential contaminants that could adversely affect its service life. Additionally, seal **68** serves to prevent grease leakage from the internal side of the bearing housing, maintaining proper lubrication and operational efficiency. The inclusion of tapered roller bearings **64**, along with the utilization of KM nut **66** and a reliable seal **68** enhances the overall performance and longevity of the shaft **60**. The components work in harmony to

ensure the smooth and efficient rotation of shaft **60** while effectively preventing the ingress of harmful contaminants.

[0068] Further, flask barrel **40** includes a ring gear **70. FIG. 13** shows a perspective view of ring gear **70,** in accordance with one embodiment of the present invention. Ring gear **70** attaches to flask barrel **40** at the top and to shaft **60** at its base. Further, ring gear **70** connects to a motor gear **80** of motor **44** and enables a reduction in rotational speed while simultaneously increasing torque output. In one example, ring gear **70** includes 150 helically shaped teeth, with an outer diameter of 803.2 mm and an inner diameter of 596 mm. Along its normal teeth surface, ring gear **70** includes ten (10) threaded holes with M10 specifications to facilitate the assembly of ring gear **70** to assembly of shaft **60**. The threaded holes ensure a robust and reliable connection between ring gear **70** and the rest of the system. **FIG. 14** shows a cross-sectional view of flask barrel **40** having ring gear **70** assembled to shaft **60.**

[0069] Further, CMPES device **10** includes motor **44. FIG. 15** and **FIG. 16** show a perspective view and a cross-sectional view, respectively of motor **44,** In accordance with one embodiment of the present invention. In accordance with the present invention, CMPES device **10** includes six (6) motors **44,** each motor **44** designed to connect to top plate **30** at motor receiving section **34**. Each motor **44** includes a motor housing **78** and is directly coupled to a helical gear (motor gear) **80** having 27 teeth. Motor gear **80** has 149.7 mm outer diameter. Each individual motor **44** is capable of delivering a power output of 0.75 kW, along with a nominal output torque of 4.95 Nm and a peak torque of 12.7 Nm. Motors **44** are meshed with the main barrel gear, which is directly connected to the central flask barrel **40**. This configuration ensures effective power transmission throughout the system. When the total mass of the system/ CMPES device **10** reaches its maximum of 720 kg, the maximum achievable rotational speed is approximately 250 rotations per minute (rpm), which is facilitated by three active motors. The usage of six motors **44** allows for a switching mechanism, where three motors are in use (active state) while the other three are in a resting state. This rotational power distribution ensures efficient operation and prevents excessive strain on any individual motor. To ensure a secure connection, motor gear **80** is equipped with helical teeth **82**, enhancing efficiency

and performance. Motor gear **80** is directly mounted on a main motor rotor shaft **84** and axially secured using a keyway **86**, a steel cap **88**, and a cone socket screw **90**.

[0070] Further, CMPES device **10** includes five (5) disc flux generators (or disc generators) **92. FIG. 17** and **FIG. 18** show perspective views of disc flux generator **92,** in accordance with one embodiment of the present invention. Disc flux generators **92** position inside flask barrel **40** whereby each disc flux generator **92** is designed to produce the desired kilowatt output. Disc flux generators **92** are constructed using three high-quality aluminum parts that are TIG welded together. Flask barrel **40** serves as one of the components, along with a smaller support inside the cylinder and a ring equipped with screwing threads and through holes. Disc flux generators **92** are mounted directly inside flask barrel **40**, ensuring they are centered at the top of main motor rotor shaft **84** within flask barrel **40**. This configuration allows for efficient power generation and facilitates the proper alignment and functioning of the disc generators. By placing disc flux generators **92** inside flask barrel **40**, the overall structural integrity and stability of CMPES device **10** is maintained, ensuring reliable and consistent electricity production.

[0071] In one implementation, the design of disc flux generators **92** incorporates a larger-sized disc flux generator **92** at the bottom of flask barrel **40** in order to deliver higher kilowatt output. In other words, disc flux generators **92** are optimized for increased power generation. The construction of these larger-sized disc flux generators **92** involves utilizing high-quality materials and advanced manufacturing techniques. By strategically placing the larger disc flux generators **92** at the bottom of flask barrel **40**, the design ensures efficient utilization of available space and maximizes power output. The configuration allows for enhanced energy conversion and improved overall performance of the machine. Here, the larger-sized disc flux generators **92** contribute to a significant increase in kilowatt output, making CMPES device **10** capable of generating higher levels of electricity. Larger-sized disc flux generators **92** enhances CMPES device **10** potential for meeting the energy demands of various applications, including those requiring a substantial power supply. The construction of CMPES device **10** incorporates these larger-sized disc flux generators **92** to provide a reliable and efficient solution for generating higher kilowatt output, addressing the needs of a wide range of power requirements.

[0072] **FIG.19** shows a cross-section of CMPES device **10**, specifically the area motor **44** and its gear mesh with ring gear **70** connected. Ring gear **70** along with a protective sheet **94** on the outside are securely screwed to flask barrel **40**. Additionally, the partial section view showcases three assembled flask barrels on the interior (located on the right side of the section view). In order to mount motor **44**, at first, motor **44** is positioned from the bottom side of top plate **30** and secured in place using four bolts. A distance ring is then placed on top of main motor rotor shaft **84**, followed by the pinion gear. To prevent torsion, a keyway with dimensions of 6x30 mm is added to the main motor rotor shaft **84**. Axially, the gear is secured using a cap and a cone socket bolt. Next, ring gear **70** is assembled onto flask barrel **40**. In one example, ten M10 screws are used to firmly bolt it in place. To ensure stability and prevent twisting of the screws, five DIN 8732 10x50 dowel pins **96** are added to secure ring gear **70,** as shown in **FIG. 20**. This construction design guarantees a secure and reliable connection between motor **44**, gear, and ring gear **70**, maintaining the integrity and functionality of CMPES device **10.**

[0073] Further, CMPES device **10** includes a protective fence **98,** as shown in **FIG. 21**. In one embodiment, protective fence **98** is installed over the top of the assembly of CMPES device **10**, encompassing a pinion gear and ring gear. Protective fence **98** is constructed from perforated sheet metal steel, which is precisely laser-cut to create the mesh pattern. On the bottom side of the sheet, a vertical ring is point welded, adding further reinforcement. Protective fence **98** features multiple holes that facilitate its assembly to the main top plate **30** of the main structure. These holes serve as attachment points for securing the protective mesh in place. To guard against corrosion, protective fence **98** is treated with a corrosion-resistant paint coating. Protective fence **98** effectively safeguards the assembly, ensuring the longevity and durability of the machine by preventing unwanted contact or interference with the pinion gear and ring gear.

[0074] **FIG. 22** shows protective fence **98** strategically positioned using twelve distance rings **100** that are situated in close proximity to the electrical motors **44**. Rings **100** ensure that protective fence **98** is set at a safe distance from both the motor drive gear and the machine ring gear. The arrangement guarantees that there is ample space, preventing any possibility of tools or hands coming into contact with the rotating gears while CMPES device **10** is in operation. The inclusion of distance

rings **100** prioritizes safety and mitigates the risk of accidents or unwanted interactions with the moving parts of CMPES device **10**.

[0075] Further, CMPES device **10** includes decorative panels **102. FIG. 23** shows a perspective view of decorative panel **102,** in accordance with one embodiment of the present invention. Decorative panels **102** are used to conceal and protect the bottom side of CMPES device **10.** In one example, two half-circle sheet metal decorative panels **102** are used to cover the bottom side of CMPES device **10.** Decorative panels **102** are precisely bent to match the diameter of the main body machine structure. To ensure a secure fit, these two decorative panels **102** are directly fastened to the main steel frame using several screwing points with DIN 7991 M4 screws. The construction method ensures a neat and seamless appearance while providing structural integrity and stability to the machine.

[0076] Furthermore, CMPES device **10** includes a cover cap **104. FIG. 24** and **FIG. 25** show a perspective view and a cross-sectional view, respectively of cover cap **104,** in accordance with one embodiment of the present invention. Cover cap **104** is constructed using PA6 plastic material and has a dome shape **106**. Dome shape **106** can be replaced with alternative shapes as needed. Cover cap **104** is designed to be manually inserted into flask barrel **40** by applying pressure from the top until it is securely positioned to flask barrel **40**. To facilitate ease of use, cover cap **106** features a small flange-like geometry **108** on its side, providing ample grip for opening or closing the upper section of CMPES device **10**. The design ensures convenient access to the internal components while maintaining a secure and enclosed environment.

[0077] Now referring to **FIG. 26** to **FIG. 52**, operation of CMPES device **10** is explained, in accordance with one exemplary embodiment of the present invention. As specified above, CMPES device **10** includes five (5) disc flux generators **92** positioned inside flask barrel **40.** In order to achieve constant rotation, reaching full rotation of 250 rpm or necessary rotating rpm to generate desired kilowatt in 60 seconds or more achieving constant rotation, results in continuous power output. In the present embodiment, three out of six motors **44**, each capable of delivering at least 0.75 kW power and a combined power output of 2.25 kW power to rotate flask barrel **40** constantly are considered. Three motors **44** get the power from disc flux

generators **92** and give the power output to electrical panel systems connected to CMPES device **10.**

[0078] **FIG. 26** shows a circuit diagram **150** of 3-phase electric supply originating from disc flux generators **92** to electrical panel systems. Circuit diagram **150** includes three power sources (three phase power sources of 15 kW) **152, 154**, **156** connected to Variable Frequency Drives (VFD) **176**, **178**, **180**, **182**, **184**, **186** via circuit breakers **158, 160, 162, 164, 166, 168, 170, 172, 174.** Further, VFDs **176**, **178**, **180**, **182**, **184**, **186** connect to motors **188, 190, 192, 194, 196** and **198.** Here, each motor **188, 190, 192, 194, 196** and **198** delivers a power output of 0.075 kW. As specified above, cylinder flask barrel **40** full rotation rpm produces enough rpm speed for disc flux generators **92** to give the desired, setting output power up to hundreds of kilowatts. Here, disc flux generators **92** are arranged in combination of 5 kW - 100 kW. Disc flux generators **92** are arranged to provide a total of output kilowatts at about 85% efficiency in total sum of disc flux generators which flask barrel **40** holds and rotates constantly with rotation of 250 rpm or desired rpm. The power output from disc flux generators **92** and flask barrel **40** give continuous power to motors **44** which run its own motors for constant rotation and speed rpm as needed.

[0079] **FIG. 27** and **FIG. 28** show tables **200, 210** presenting initiation calculation and selection of motors. The motor selection process begins with the initial requirements provided. The key criteria include an approximated load mass of 600 kg from disc flux generators **92**, a maximum rotation speed of flask barrel **40** at 250 rpm, and a preference for low motor power output, ideally around 0.5 kW per motor. The initial flask barrel **40** geometry is approximately 750 mm. Another requirement is to have at least three motors on CMPES device **10**, although more than two motors are desired. In order to analyze CMPES device's **10** kinematics and dynamics, a preliminary calculation is performed, incorporating a 20% safety margin and an acceleration time of approximately 60 seconds with an added mass of 720 kg. In order to reduce the motor size and meet the desired requirements, the possibility of incorporating a gearbox is considered. A gear module of 5 is used to check whether the gears can handle the driving forces applied to the ring gear. Pinion gear having 27 teeth is considered. Considering the use of rolling bearings, a friction coefficient of 0.01 is assumed. The system's preload is accounted for and set

at 30% of the total. The calculations were conducted considering the use of three motors.

[0080] From the initiation calculation and selection, it is observed that a motor with a power output of 1.1 kW provides a most suitable solution, even for a load of 720 kg with the disc flux generators **92** and flask barrel **40**. However, due to the requirement of having a motor with less than 1 kW power output, the second solution is chosen as the first-best candidate. Although the motor with 1.1 kW is slightly over-dimensioned for the 720 kg load, it has shown to operate at 83% capacity during the initial acceleration stage and 32% during nominal operation time. The initial pinion drive gear with a module of 5, 27 teeth, and a diameter of 143.239 mm resulted in a transmission ratio of i=5.5556 indicating that from the motor's initial speed of 1465 rpm, the rotational speed is reduced to 263 rpm.

[0081] Subsequently, a second calculation is conducted for a required mass of 600 kg at 250 rpm, using the same drive pinion gear and a transmission ratio of 5.5556. The results obtained are presented in tables **220, 230** shown in **FIG. 29** and **FIG. 30**.

[0082] After conducting the second preliminary calculation, the resulting data indicated that the SEW Eurodrive motor with a power output of 0.75 kW, a speed of 1440 rpm, and a torque of 4.95 Nm is the most suitable and balanced candidate for selection. This motor demonstrated optimal utilization, with almost 102% of its acceleration torque being utilized during the initial starting acceleration phase. To further validate this selection, a third calculation was performed. The results from this calculation confirmed the suitability of the SEW Eurodrive SEW IE3 DRN80M4 motor for the present application. The motor characteristics i.e., torque speed graph **240** and peak torque **250** are shown in **FIG. 31** and **FIG. 32**, respectively.

[0083] Referring to **FIG. 33**, a table **260** showing input data for gear (ring gear and drive gear) profile design is shown. Based on the initial preliminary kinematic and dynamic calculation of the motor, the basic sizes for the pinion and ring gear are determined. To further refine the design of these gears, a precise calculation is performed using the MDESIGN™ software, which is specifically used for dimensioning mechanical components and elements. The calculation is performed based on the guidelines provided by the DIN 3990 standard. The input data required for creating the gear teeth calculation, including the profile, tip root diameter, and

reference diameter, are illustrated in **FIG. 33**. The parameters are considered to ensure the accurate sizing and performance of both the pinion driver gear and the driven ring gear. Based on the initial input data, output calculation and design of the gears received is presented in a table **270** shown in **FIG. 34**. Further, tooth profile (evolvent) pinion **280** is shown in **FIG. 35** and tooth profile (evolvent) gear **290** is shown in **FIG. 36**. In addition, gap of tooth (envelope curve, evolvent) pinion **300** is shown in **FIG. 37** and gap of tooth (envelope curve, evolvent) gear **310** is shown in **FIG. 38**. **FIG. 39** shows a side view of pinion **320** and **FIG. 40** shows a side view of gear **330. FIG. 41** shows a front view of pinion **340** and **FIG. 42** shows a front view of gear **350.**

[0084] **FIG. 43** shows a circuit diagram **360** of 3-phase electric supply originating from disc flux generators to electrical panel systems. Circuit diagram **360** includes a single power source (three phase power source of 5 kW) **362** connected to Variable Frequency Drives (VFD) **372, 374, 376** via circuit breakers **364, 366, 368, 370.** Further, VFDs **372, 374, 376** connect to motors **378, 380, 382.** Here, each motor **378, 380, 382** delivers a power output of 0.075 kW. As specified above, cylinder flask barrel **40** full rotation rpm produces enough rpm speed for disc flux generators **92** to give the desired, setting output power up to hundreds of kilowatts. Here, disc flux generators are arranged in combination of 5 kW - 100 kW. Disc flux generators are arranged to provide a total of output kilowatts at about 85% efficiency in total sum of disc flux generators which flask barrel **40** holds and rotates constantly with rotation of 250 rpm or desired rpm. The power output from disc flux generators and flask barrel **40** give continuous power to motors which run their own motors for constant rotation and speed rpm as needed.

[0085] In one implementation, CMPES device utilizes a hand crank handle system for initiating a motor. **FIG. 44** shows a cross-sectional view of a CMPES device **390** utilizing a hand crank handle system, in accordance with one exemplary embodiment of the present invention. CMPES device **390** includes an outer shell **392** encompassing a cylindrical barrel **394.** Barrel **394** includes a bevel gear wheel **396.** Bottom **398** of barrel **394** presents a mixing material. Further, barrel **394** includes a shaft **400** having bearings **402** at the top and bottom. CMPES device **390** presents a bevel gear pinion **404** connecting bevel gear wheel **396.** Further, bevel gear pinion

404 connects to a bearing sleeve **406,** which in turn connects to a handle **408.** Handle **408** includes a lever **410.**

[0086] Here, hand crank system having handle **408** is used to produce initiation, power, and output for three motors **378, 380, 382** when CMPES device **390** needs to start working in very remote areas. The hand crank system helps to take away battery storage or grid power to use. The hand crank device system includes gears and a small size cylinder of 375 mm diameter as presented in **FIG. 45** using table **420**. Hand crank device system helps to reach 150 rpm for a mass of 150 kg cylinder containing one 5 kW disc flux generator. This results in full rotation by hand in a very short time by a normal person. Starting from 1 to 5 minutes will produce a 150-rpm speed rotation for a 5 kW disc flux generator in the small cylinder to have enough power of output of 2.25 kW for 3 motors of 0.785 kW each to establish a full rotation for the CMPES cylinder barrel system. Pinion and wheel bevel gear (bevel and hypoid gear for 5 kW cylinder barrel) calculations are shown in Tables **430, 430, 440, 450, 460, 470, 480** and **490** presented in **FIG. 46, FIG. 47, FIG. 48, FIG. 49**, **FIG. 50, FIG. 51** and **FIG. 52** respectively.

[0087] The presently disclosed CMPES device provides several advantages over the prior art. The CMPES device utilizes multiple disc flux generators arranged in a cylindrical shape and constantly powered for rotation using low-wattage motors. The inclusion of disc flux generators is particularly advantageous due to their proven high efficiency and minimal maintenance requirements. The overall system design has been optimized to be cost-effective in terms of manufacturing, installation, and maintenance, ensuring accessibility to a wide range of applications and users. By addressing the shortcomings of traditional renewable energy technologies, the CMPES device generates a consistent power supply that is not dependent on weather conditions. The CMPES device eliminates the need for a separate storage system, streamlining the overall energy generation process. By circumventing the existing obstacles associated with renewable energy devices, this invention presents a distinctive and invaluable contribution to the ongoing transition toward sustainable energy generation. The CMPES device potential lies in its ability to establish a more efficient and reliable renewable energy system, ushering in a new era of sustainable power generation.

[0088] A person skilled in the art appreciates that the CMPES device can come in a variety of shapes and sizes depending on the need. Further, many changes in the design and placement of components may take place without deviating from the scope of the presently disclosed CMPES device.

[0089] In the above description, numerous specific details are set forth such as examples of some embodiments, specific components, devices, methods, in order to provide a thorough understanding of embodiments of the present invention. It will be apparent to a person of ordinary skill in the art that these specific details need not be employed, and should not be construed to limit the scope of the invention.

[0090] In the development of any actual implementation, numerous implementation-specific decisions must be made to achieve the developer's specific goals, such as compliance with system-related and business-related constraints. Such a development effort might be complex and time-consuming, but may nevertheless be a routine undertaking of design, fabrication, and manufacture for those of ordinary skill. Hence as various changes could be made in the above constructions without departing from the scope of the invention, it is intended that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

[0091] The foregoing description of embodiments is provided to enable any person skilled in the art to make and use the invention. Various modifications to these embodiments will be readily apparent to those skilled in the art, and the novel principles and invention disclosed herein may be applied to other embodiments without the use of the innovative faculty. It is contemplated that additional embodiments are within the spirit and true scope of the disclosed invention.

WHAT IS CLAIMED IS:

1. A constant micro power energy system (CMPES) device, comprising:

a main body structure comprising a base plate, a frame extending from said base plate, and a top plate positioned at the top of said frame;

a flask barrel positioned in said frame;

motors positioned on said top plate, wherein each motor is splined to a helical gear, and wherein each of said motor comprises a motor shaft;

a ring gear connecting said flask barrel and said motor shaft; and

disc generators positioned inside said flask barrel,

wherein said motors supply power to drive said flask barrel to rotate constantly at a predetermined speed in order to generate continuous and simultaneous Alternating Current (AC) and Direct Current (DC) electrical power output, and wherein said motors facilitate direct transmission to said disc generators in order to provide the electrical power output to panel systems connected to said CMPES device.

2. The CMPES device of Claim **1**, wherein said motors generate the electrical power output of 2.25 kilowatt (kW).

3. The CMPES device of Claim **1**, wherein each of said motors are configured to deliver a power output of 0.075 kW to 1.1 kW.

4. The CMPES device of Claim **3**, wherein two or more motors of said motors are configured to be in an active state and remaining motors of said motors are configured to be in a resting state, and wherein said two or more motors in the active state deliver a combined power output of 2.25 kW to rotate said flask barrel constantly.

5. The CMPES device of Claim **2**, wherein said flask barrel rotates at the predetermined speed of 250 rotations per minute (rpm).

6. The CMPES device of Claim **1**, wherein said disc generators are positioned inside said flask barrel such that a larger-sized disc generator of said disc

generators positions at the bottom to deliver a higher kilowatt output, and wherein said disc generators are adjustable without changing the functionality of rotating of a cylinder in the disc generators.

7. The CMPES device of Claim **1**, further comprises decorative panels, wherein said decorative panels encapsulate the bottom side of said main body structure.

8. The CMPES device of Claim **1**, further comprises a cover cap, wherein said cover cap inserts onto said flask barrel and facilitates convenient opening and closing.

9. The CMPES device of Claim **1**, wherein said disc generators are arranged in combination of 5 kW-100 kW disc generators.

10. The CMPES device of Claim **1**, further comprises a protective fence and distance rings, wherein said protective fence positions on said distance rings to provide a safe distance between a motor drive gear of each of said motor and said ring gear in order to prevent accidental contact during operation.

11. The CMPES device of Claim **1**, wherein said flask barrel and said disc generators are configured to efficiently extract and generate micro power from continuous motion to provide the electrical power output.

12. The CMPES device of Claim **1**, wherein said flask barrel and said top plate are assembled to form a rigid and precise structure in order to ensure optimal alignment and stability during operation.

13. The CMPES device of Claim **1**, further comprises a control system to monitor and regulate the power output of said disc generators in order to ensure optimal energy conversion and utilization.

14. The CMPES device of Claim **1**, further comprises a hand crank handle system, wherein said hand crank handle system facilitates in manual initiation of power to operate said motors.

15. A method of providing a constant micro power energy system (CMPES) device for generating power, said method comprising the steps of:

providing a main body structure having a base plate, a frame extending from said base plate, and a top plate positioning at the top of said frame;

providing a flask barrel positioned in said frame;

providing motors positioned on said top plate, each motor splined to a helical gear, each of said motor comprising a motor shaft;

providing a ring gear connecting said flask barrel and said motor shaft;

providing disc generators positioned inside said flask barrel;

operating said motors for suppling power to drive said flask barrel to rotate constantly at a predetermined speed in order to generate continuous and simultaneous Alternating Current (AC) and Direct Current (DC) electrical power output; and

facilitating direct transmission from said motors to said disc generators in order to provide the electrical power output to panel systems connected to said CMPES device.

16. The method of Claim **15**, further comprising selectively operating two or more motors of said motors for delivering a combined power output of 2.25 kW to rotate said flask barrel constantly.

17. The method of Claim **15**, further comprising operating said flask barrel to rotate at the predetermined speed of 50-1500 rotations per minute (rpm).

18. The method of Claim **15**, further comprising:

positioning a larger-sized disc generator of said disc generators at the bottom to deliver a higher kilowatt output; and

adjusting said disc generators without changing the functionality of rotating of a cylinder in the disc generators.

19. The method of Claim **15**, further comprising providing a control system for monitoring and regulating the power output of said disc generators in order to ensure optimal energy conversion and utilization.

20. The method of Claim **15**, further comprising providing a hand crank handle system for manually initiating power to operate said motors.