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(54) **Title:** WINDMILL ELECTRICAL POWER SYSTEM AND TORQUE ENHANCED TRANSMISSION

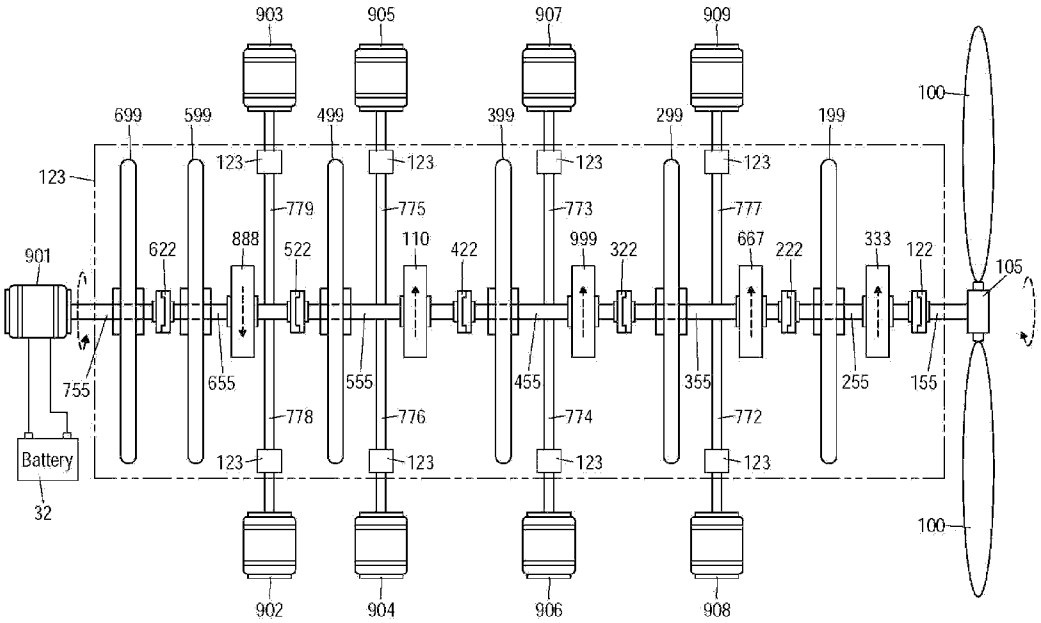

FIG. 4

(57) **Abstract:** The present specification relates to power generation systems that generate, transmit, store, convert, transform, combine many forms of energy using a Torque Enhanced Transmission. The mechanism named Torque enhanced Transmission has multiple speed stages each having layshafts for connecting an auxiliary torque enhanced electrical machine to store energy. The power bus allows multiple combinations of input output power devices. The windmill electrical system combines AC and DC generators together in one system that can generate or operate as a motor to drive the system and a marine vessel. A motorized vehicle or marine vessel can use the system as a large electric motor generator or use the components independently. The present invention relates generally to systems and methods for generating power using a renewable energy source or multi fuel source.

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WINDMILL ELECTRICAL POWER SYSTEM AND TORQUE ENHANCED TRANSMISSION

FIELD OF THE INVENTION

The present specification relates to power generation systems that generate, transmit, store, convert, transform, combine many forms of energy using a Torque Enhanced Transmission. The mechanism named Torque enhanced Transmission has multiple speed stages each having layshafts for connecting an auxiliary torque enhanced electrical machine to store energy. The power bus allows multiple combinations of input output power devices. The windmill electrical system combines AC and DC generators together in one system that can generate or operate as a motor to drive the system and a marine vessel. A motorized vehicle or marine vessel can use the system as a large electric motor generator or use the components independently. The present invention relates generally to systems and methods for generating power using a renewable energy source or multi fuel source.

BACKGROUND OF THE INVENTION

The Torque enhanced gearbox in patent US 7108095 defines a Torque enhanced gearbox that operates by increasing rpm and the exponential increase in the amount of kinetic energy that can be stored So when speed doubles kinetic energy increases by a factor of four. The last stage of the Torque Enhanced Transmission uses a speed decreaser to reach the desired speed while increasing the torque. For example, a 3x reduction in speed produces a 3x increase in torque. What is needed are speed stages after each flywheel and a lay shaft at each speed stage allowing traditional gears to be replaced by lower cost speed increases or decreasers as well as multiple ports to attach additional prime movers and multiple power output options. The transmission of the current invention can be applied to numerous applications as the RPM input range is greatly increased. For example, slow and intermittent input speeds are a major factor in the higher cost of many renewable energy sources.

The large gear ratios in conventional windmills cause many problems such as downtime and an overall reduction in return on investment for systems using them. The large gear ratios put heavy stress on windmill components and lead to higher cost of operation. Large multi stage Planetary gearboxes do not provide energy storage, cost more, and are under high stress and do not attach to multiple generators or energy storage with the

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simplicity as the present invention. Inverters. synchronous generators add cost and unwanted fluctuations in the grid. Induction generators have a much smaller operating rpm range and the Torque enhanced transmission allows a solution to the induction generators that are small, relatively constant.

Wind, solar, geothermal, and hydro are sources of energy that would benefit from the Torque enhanced transmission by reducing cost per kilowatt hour and adding energy storage for improved grid peak load management. High speed applications like UPS power systems that require 50,000 rpm or more can use the Transmission to reach these speeds while producing AC and DC power in one system or using both AC, DC or any other fuel type the application calls for. Multiple speed stages are a useful improvement and described with the present invention. The torque enhanced transmission can be used to produce power from a wide range of prime movers. Torque Enhanced Transmission includes multiple speed stages, layshafts , flywheels, clutches. The multiple stages have a lay shaft with torque Enhanced Transmission torque generator attached to store energy. The Transmission capable of achieving output speeds that are optimal for electrical and mechanical power while accepting prime mover of any speed. The system speeds up to store maximum kinetic energy and capture peak input from the energy source then gears down the output speed to a desired rpm for a given application in a way that reduces cost, improves efficiency of the generator, and captures more input power source. The system provides peak load power and energy storage for renewables and propulsion power.

According to an embodiment, the the torque-enhanced transmission In an embodiment of the present invention for mechanical power needed to move vehicles with higher weight, the speed and torque needed to perform while using a smaller sized prime mover or multiple fuel prime movers, hybrid electric The mechanical batteries of the torque enhanced transmission allowing generational steps in the move to electric transportation. For example, a vehicle can have a reduced size prime mover using the Torque enhanced transmission attached to the drive shaft to produce mechanical power and is engaged for peak loads. The prime mover can be a small electric motor and the gasoline engine is reduced by a significant size. An all-electric vehicle can have the same small motor in addition to its electric motor prime mover and the system acts as a turbo charger for an electric car as electric motor torque is constant and excess torque goes to the torque Enhanced transmission from the wheel then to mechanical or electrical power. The system can generate power from many inputs at each lay shaft in large vehicles as power flows back from the wheel to recharge the battery or to aid a fossil fuel engine therefore reducing size. The electric prime mover can be divided into sections and be activated as needed and be made smaller while still being a large motor if needed.

According to an embodiment, the torque-enhanced transmission functions as a mechanical battery drive shaft for converting mechanical energy to mechanical propulsion.

According to an embodiment, the torque-enhanced transmission allows low rpm input applications to reach the high speeds required for cost-effectiveness and efficiency by adding speed increasers in smaller but multiple speed stages. According to an embodiment, auxiliary layshafts are the only way to achieve an efficient flow of kinetic energy back and forth from the auxiliary output shafts to the main drive shaft. According to an embodiment, the torque-enhanced transmission has multiple speed stages, each with layshafts connected to an auxiliary torque-enhanced transmission at each stage, allowing the energy stored as kinetic energy to be discharged in small amounts and stored at high speeds in the motor-generator storage device that allows the torque-enhanced transmission to function as a mechanical battery and the energy to be discharged more efficiently. According to an embodiment, the torque-enhanced transmission improves peak loads in a grid and provides energy storage solutions for renewable energy sources,

According to one embodiment, the the torque-enhanced transmission of the present invention is to provide a power generation system that secures the grid reduces the sensitivity to the price of oil and reduces risk of grid failure while improving the quality of life for all people

According to an embodiment, the torque-enhanced transmission is integrated into the motors generator and magnetic bearings Where the rotor has a minimum of three sections and three speeds. Where the Motor Generator flywheel rotor has magnetic bearings. Where the radial bearings the generator rotors and motor rotors are weighted and sized to be an energy storage device. The device is a torque generator.

According to an embodiment, the the torque-enhanced transmission is a rotary ups uninterrupted power supply (UPS) power systems that require large energy stores and high speeds can use the torque-enhanced transmission to reach these speeds while producing alternating current (AC) and direct current (DC) power in one system or using AC, DC, and any other fuel type the application requires. The system has a chemical battery and an ac source. The layshaft energy storage devices have reduced cost and store energy. The system allows for multi fuel prime movers and connects to a battery bus.

According to an embodiment, the torque-enhanced transmission Any motorized vehicle propulsion system or power generation system incorporating the torque-enhanced transmission described herein has greater options for power flow. The system can connect many wheels, propellers and power sources while allowing a reduced size of system.

According to an embodiment, there is a need for speed increasers after each section and a perpendicular or parallel shaft at each speed stage allowing multiple ports to attach additional prime movers and multiple power output/ input options.illustrates Torque Enhanced electrical system being integrated in the main shaft of the transmission, All components fit together inside one flywheel. The system is capable of operating as an induction motor /generator and a DC motor generator in one system.

According to an embodiment,According to an embodiment, the the torque-enhanced transmission each speed stage may have a perpendicular or layshaft that allows for power to be delivered to multiple smaller generators or to mechanical power applications. or to propel a water turbine, an air turbine and motor using any fuel source.

According to an embodiment, the torque-enhanced transmission can extract energy from wind turbine blades and from ocean wave energy. The energy can be extracted and stored in the system to produce mechanical energy to drive a water propeller to drive the marine vessel that houses the wind turbine electrical system of the current invention. Electrical energy can be produced to make electromagnetic propulsion with the same system. The system can be installed in Tall building structures and collect wind solar or just act as a UPS power electric generator.

According to an embodiment, According to an embodiment, the the torque-enhanced transmission the turbine electrical system includes a renewable energy source, a torque-enhanced transmission or torque-enhanced gearbox, wherein there are multiple flywheels of different sizes and operating at different speeds in different stages with magnetic bearings to create a less stressful workload, along with a reduced size induction generator, while providing energy storage for renewable energy.

According to an embodiment, at least one flywheel may be a spoked flywheel with a weighted outer perimeter. According to a further embodiment, the weighted outer perimeter may weigh approximately 2200 kg. According to an embodiment, a first flywheel may be designed such that the second and third flywheel fits inside and has multiple layshafts being attached in a 360-degree design.

According to an embodiment, wind turbine blades can deliver more energy to a torque-enhanced transmission as all speeds deliver energy to the torque-enhanced transmission and interior speeds achieved by the torque-enhanced transmission's energy storage devices may exceed those speeds required by a generator. The use of different speed stages in embodiments allows for large torque transfer from peak wind and any layshaft electrical machines. In this

regard, the layshaft design is crucial as the system's power flow allows energy to be stored while also performing the essential duty of acting as a torque overflow pressure relief valve.

According to an embodiment, According to an embodiment, the the torque-enhanced transmission the turbine electrical system includes a renewable energy source and acts as an inverter by connecting a solar array to a dc motor that turns the torque enhanced transmission that drives an induction motor connected to the ac power grid.

Prior Art

Patent US 7108095 claims a torque enhanced gearbox and a method of generating power using a speed increaser, flywheel, clutch, and speed decreaser to bring the speed of the flywheel assembly to a speed above the operating speed of the generator then stepping down the output shaft with a speed decreaser.
Furthermore, United States Patent application number
US 7108095 teaches a gearbox that includes a single speed increaser and a single claim speed increaser can have a higher gear ratio that equals the sum of multiple speed increasers but limits features and benefits that multiple speed increasers provide.Some of the advantages adding the speed increasers in multitude include allowing for additional input output speed combinations, reduce cost by allowing less expensive speed increaser options as a pulley belt driven variable speed pulley transmission system and lay shafts for attaching energy storage devices at each cell.

What is needed is a Torque Enhanced Transmission with a wider range between input speeds and output speeds that maximize the benefits of The Torque enhanced Transmission and allow the higher constant speeds that induction type generators require. Adding multiple speed stages in a flywheel transmission offers a cost reduction in gearing and generators. Efficiency is increased by the transmission's relatively constant output speed. Multiple speed increasers can accept lower rpms and achieve higher output speeds. The flywheels in the transmission become more than energy storage devices and act as a stress reduction in the system thus allowing more cost-effective energy storage. With lower stress on the system lower cost gearing can be used while allowing the input speeds as well as output speeds to have a wider range. Furthermore, the system allows the constant speed induction generator to be used and the inverter to be omitted from electrical generating systems. The relatively constant and multiple output speeds of the transmission allow power to be delivered at

application specific speeds. The Torque Enhanced Transmission allows for the induction type generator to be used as well as its size to be reduced and the multiple speed stages allow for multiple types of generators of smaller size can be used where the sum of the multiple smaller generators or power applications equals the power output of one larger generator used in other electrical or mechanical power applications that use traditional gearboxes.

The torque enhanced transmission or the present invention is a needed improvement over other transmissions used in traditional windmills, power generation systems, and electrical generation systems. The addition of speed increasers in several stages allows different speeds to be accepted and stored. A single speed increaser with a larger gear ratio drives the flywheel apparatus at a single speed and different stages allow the mechanical battery to have cells to charge and discharge. The speed stages give a platform where one stage is a function of the next thus reducing cost of the gearing and stress on the system. Generator size can be reduced i f the system runs for longer with lower output i f the speeds can be designed for in a cost-effective way. For example, wind turbine blades might operate at 36 rpm and a single speed increaser would not be able to be a simple and efficient cost-effective component i f its ratio were 5 to 1. Then said flywheel at 180 rpm and the next at 900 rpm then 4500, then 22500rpm and as many stages as needed. The large gear ratio of large conventional windmill gearboxes has been known to break down and are expensive. The Torque Enhanced Transmission steps up the speed while not under load and the energy storage device aspect allows for multiple points to store kinetic energy in the torque generators while maintaining its primary job as energy storage device.

Each speed stage has a lay shaft that allows for power to be delivered to multiple smaller generators, or to mechanical power applications. The method and design described here are not simply a different way to accomplish what a single larger gear ratio speed increaser would accomplish. reduced. Adding multi stages and multiple speed increasers allow a greatly improved system. The higher speeds needed to use the induction type generator, provide backup power, peak load protection requires multiple speed increasers to maximize the benefits in generating power as well as lowering cost, and allowing for multiple prime movers and a variety of generators.

According to an embodiment, the torque-enhanced transmission In an embodiment of the present invention Permanent magnet generators can benefit from the Torque enhanced transmission. The transmission would allow for a much smaller diameter and reduce permanent magnets needed for small PMG and the speed increasers would work in reverse during system shutdown by draining the power from the system after the induction type generator falls below its operating range. The PMG could be used to charge the battery system that supplies power to a small electric motor used to maintain the system's speed. During times of no wind or power input or i f the energy would be better used later.

According to an embodiment the torque enhanced Transmission is a mechanical battery when a torque generator is attached. A battery that produces and outputs AC power and works as a hybrid type battery when used with DC battery types. Magnetic bearings are used, and the Torque enhanced Transmission is enclosed in a vacuum. The complete elimination of the gearbox in
permanent magnet direct drive systems have disadvantages the Torque enhanced gearbox can improve or eliminate. For example large

diameters are needed in the generator to make up for very slow input speeds. Direct drive systems use large radius generators because of the low input speeds. These generator types use rare earth magnets therefore increasing the cost of the system. The inverter is still required, and the size of the components cannot be reduced and therefore cost more. The large diameter of the stator could be retrofitted and used as a flywheel in the Torque enhanced transmission The Combination would allow using a PMG and an induction generator in the same system. The torque enhanced transmission would be useful with these generator types, by reducing the diameter where the magnets are needed, Using the transmission allows both induction and PMG to be used in one system. The Torque enhanced transmission allows multiple torque generators and or AC generators to be used in one system while reducing the stress and cost of the system.

The range of acceptable input/output speeds and the other benefits described here would improve other power generating systems. Adding Torque enhanced Transmission will allow generator prime mover combinations to previously cost prohibitive applications. According to an embodiment, the torque-enhanced transmission, both wind and Ocean wave energy can be extracted and stored in the system to produce mechanical and or electrical energy for a marine vessel. As energy can be stored, generator size is reduced or divided into smaller generators of different types all while increasing efficiency of the generator and capturing more energy from more difficult forms of energy and used to drive the marine vessel. Improving peak loads in the grid and improves the energy storage issues some renewable energy sources have. Using multiple speed increaser allows multiple speed stages that are used to maximize to final stage speed and kinetic energy storage and allows a lay shaft to be attached at each speed stage.

These things transform the system of the current invention by allowing options to the number and type of motors generators, energy storage UPS systems and /or mechanical power outputs. The Torque generators act as energy storage devices, allow a wide range in acceptable speeds as well as reduce system stress. The added speed lay shafts' speed increase, allowing the system to be a mechanical battery drive shaft.

Torque enhanced transmission allows low rpm input applications to reach the high speeds needed in a cost effective and efficient way and adding speed increaser in smaller but

multiple gear ratios is the only way to achieve this. Simply increasing the gear ratio of the current speed increaser causes most stress on the gears, limits flywheel design option, and limits the possible rpm input output combinations for lay shafts and main shafts. Furthermore, higher rpm Speeds can be achieved with multiple speed increasers without the expense associated with high speed energy storage UPS systems.

SUMMARY OF THE INVENTION

Accordingly, one object of the present invention is to provide a power generation system that is less expensive while expanding the range of acceptable input speeds and input methods while offering many generator size and power combinations while providing energy storage and propulsion power.

Costs are reduced with a smaller generator and the same output can be achieved with smaller generators by increasing run time. Furthermore, multiple small generators can be used with the output being the same as a single large generator. The prime mover can be sized larger or smaller with no needed adjustment to the size of other components of the system. The smaller generators can act as an ac motor or the generators can be energy storage devices.

These and other objects, which will become clear to someone practicing the present invention. The system might includes a renewable energy source, a motorized vehicle a torque enhanced transmission or torque-enhanced gearbox, including multiple flywheels of different sizes and operating at different speeds in different stages with magnetic bearings for a less stressful workload, and with reduced size gearing ac two pole induction generators, while providing increased production and providing peak load for the grid. The usefulness of multiple speed stages in the current system allows the system to operate as a mechanical battery power generation mechanism. The multiple speed modulators divide the mechanical battery into different power cells with different levels of charge. The components work together as a mechanical battery drive shaft.

Thus, although there have been described embodiments of the present invention of a new and useful Torque enhanced Transmission for generating power. It is not intended that such references be construed as limitations upon the scope of this invention

What is claimed is:

1. A torque-enhanced transmission comprising:

an input shaft

an initial clutch coupled to the input shaft and the first stage shaft;

a first speed stage comprising:

a first stage shaft;

a first speed modulator coupled to the first stage shaft;

a first flywheel coupled to the first stage shaft; and

a first clutch coupled to the first stage shaft; and a first stage lay shaft

A second output shaft connected to first flywheel output shaft

a second speed stage comprising:

a second stage shaft;

a second speed modulator coupled to the second stage shaft;

a second flywheel coupled to the second stage shaft; and

a second clutch coupled to the second stage shaft and a second stage lay shaft ; and

a terminal speed stage comprising:

a terminal stage shaft;

a terminal speed modulator coupled to the terminal stage shaft;

a terminal flywheel coupled to the terminal stage shaft; and

a terminal clutch coupled to the terminal stage shaft;

an output shaft coupled to the terminal speed stage, the output shaft optionally coupled to a final flywheel and optionally coupled to an output device;

an electric drive motor and a drive shaft, the drive shaft coupled to the motor and one of the first or second stage lay shafts; and connected to a generator and a battery.

an electric generator and a drive shaft, the generator connected to the output shaft and the electric drive motor and a system battery.

The Torque enhanced transmission described where speedmodulator is interchangeable with speed decreaser\ increaser or gearing wherein the speed increasers speed up the speed of the flywheel to create an increase in kinetic energy and the speed decreaser slows down the speed of the terminal flywheel and the output shaft to provide increased torque and a desired speed of the output shaft.

2. The torque-enhanced transmission of claim 1 further having a third speed stage comprising:

a third speed increaser coupled to the second speed stage output shaft

a third speed stage flywheel coupled to the third speed increaser; and

a third speed stage output shaft; coupled to

a third speed stage auxiliary lay shaft; and

a third speed stage clutch coupled to the third output shaft;

3 The torque-enhanced transmission of claim 2 further having a fourth speed stage comprising:

a fourth speed increaser coupled to the third speed stage output shaft;

a fourth speed stage flywheel coupled to the speed increaser; and

a fourth speed stage output shaft; coupled to

a fourth speed stage auxiliary layshaft; and

a fourth speed stage clutch coupled to the third speed stage output shaft and the terminal speed stage speed decreaser.

4. The torque-enhanced transmission of claim 3 further having a fifth speed stage comprising:

a fifth speed increaser coupled to the fourth speed stage output shaft;

a fifth speed stage flywheel coupled to the fifth speed increaser; and

a fifth speed stage output shaft; coupled to

a fifth speed stage lay shaft; and

a fifth speed stage clutch coupled to the fourth speed stage output shaft and the terminal speed stage speed decrease.

5. The torque-enhanced transmission of claim 4 further having a sixth speed stage comprising:

a sixth speed increaser coupled to the fifth speed stage output shaft;

a sixth speed stage flywheel coupled to the sixth speed increaser; and

a sixth speed stage output shaft; coupled to

a sixth speed stage auxiliary layshaft; and

a sixth speed stage clutch coupled to the fifth speed stage output shaft and the terminal speed stage speed decreaser.

6. The torque-enhanced transmission of claim 5 further having a seventh speed stage comprising:

a seventh speed increaser coupled to the sixth speed stage output shaft;

a seventh speed stage flywheel coupled to the seventh speed increaser; and

a seventh speed stage output shaft; coupled to

a seventh speed stage auxiliary lay shaft; and

a seventh speed stage clutch coupled to the sixth speed stage output shaft and the terminal speed stage speed decreaser.

7. The torque-enhanced transmission of claim 6 further having an eighth speed stage comprising:

an eighth speed increaser coupled to the seventh speed stage output shaft;

an eighth speed stage flywheel coupled to the eighth speed increaser; and

an eighth speed stage output shaft; coupled to

an eighth speed stage auxiliary lay shaft; and

an eighth speed stage clutch coupled to the eighth speed stage output shaft and the terminal speed decreaser.

8. The Transmission of claim 1-7, wherein the Torque Enhanced Transmission as multiple speed stages. The torque-enhanced transmission according to any one of claims 1 to 8 comprising at least one lay shaft assembly for each speed stage of the torque-enhanced transmission and at least one auxiliary output auxiliary torque-enhanced transmission of claims 1-7 attached to at least one speed stage.

9. The Torque enhanced Transmission according to any one of claims 1 to 8 allowing each clutch to separate any speed stage or any component connected to any shaft, so that each section can rotate independently or selectively and any clutch can separate any flywheel from the any part of the Torque enhanced Transmission or anything connected to the input or output shafts, such that each component of the transmission can rotate independently from all other components. Wherein the initial clutch selectively engages or disengages the second speed stage, the first clutch selectively engages or disengages the second speed stage, the second clutch selectively engages or disengages the terminal speed stage, and the terminal clutch selectively engages the

output shaft. and a lay shaft auxiliary clutch coupled to the lay shafts and the auxiliary output shaft to selectively engage or disengage the auxiliary output/input lay shaft.

10. The torque-enhanced transmission according to any one of claims 1 to 8, wherein the clutch dog engagement type clutch, a frictional engagement type clutch, a magnetic engagement clutch Single Plate Clutch Multi Plate Clutch Centrifugal Clutch Cone Clutch Semi-centrifugal Clutch, Diaphragm Clutch Dog , Spline Clutch, Electromagnetic Clutch, Vacuum, Clutches Hydraulic clutch Freewheel Clutch engagement type clutch or any combination of any of the foregoing assemblies or a combination of multiple types.

11. The Torque enhanced Transmissionaccording to any one of claims 1 to 8 further comprising a controller for controlling energy flow in and through the Torque Enhanced Transmission in trains, high speed rail systems, Ferris wheels, cranes, trains, any electric vehicle (EV), Hybrid Electric Vehicle , or multi fuel Vehicle.

12. The Torque enhanced Transmission according to any one of claims 1 to 8 wherein the speed modulators, increasers, or speed decreasers consist of a pulley based CVT (Continuously Variable Transmission), a torque enhanced gearbox, magnetic gears, fixed ratios gears, multi speed transmissions, magnetic gearing. elliptical gears, planetary gears, ring, carrier, toothed, worm, sun, elliptical gears, electrical gears, Hydraulic, pneumatic, continuously variable transmission, an automatic multi staged transmission, a fixed ratio gear train, or a combination of any of gearing.

13. Where the motors or the generator according to any one of claims 1 to 8 are PM DC type, AC induction generators AC induction motors, PM AC reluctance induction motor/generators wherein the motor is a machinery motor, a drilling motor, an air turbine motor, a jet turbine motor, a thermal motor, an internal combustion motor, AC electric motor. DC electric motor or any type or combination. The output device is a mechanical device or any power combination.

14. .The Torque enhanced Transmission according to any one of claims 1 to 8being enclosed in a vacuum

15..The Torque enhanced Transmission according to any one of claims 1 to 8 having flywheels meaning any mechanical energy storage device such as hub rotor, disk, rotating body, ring, drum, or any other kinetic energy storage device.

16. The Torque enhanced Transmission according to any one of claims 1 to 8, having magnetic bearings.

Where the radial bearing is weighted and sized to be an energy storage device

17. The torque-enhanced transmission of claim 1-8 having bearings, motors, generators, clutches, gears , and shafts, with oversized, weighted components being rotors to operate as energy storage devices.

18. A drive shaft propulsion power generation energy recovery system and method for a motorized vehicle comprising;

the Torque enhanced Transmission according to any one of claims wherein the flywheels are connected to a coupling clutch that combines multiple speed sections together to form a single multi speed flywheel drive shaft. Where the drive shaft acts as a motor, transmission, energy storage device, generator propulsion mechanism.

19 wherein the power generation propulsion energy recovery system of claim 18 is incorporated into a motorized vehicle power generation propulsion system , a marine vese power generation propulsion system, a submarine power generation propulsion system , an artcraft power generation propulsion system, a train power generation propulsion system , a wind turbine propulsion system, water turbine propulsion systems, air turbine power generation propulsion system , jet turbine power generation propulsion system, a high speed locomotive power generation propulsion system an electromagnetic propulsion system

20 A Torque generator electrical machine comprising A torque enhanced Transmission of claim 1-18 being integrated into a motor generator flywheel magnetic bearings torque enhanced electrical machine to store mechanical energy. Where the motor generator clutches and gears have oversized, weighted rotors that operate as flywheel rotors. and fits inside the housing of the magnetic bearings

Where the rotor has a minimum of three sections and three different speeds. Where the radial bearing is weighted and sized to be an energy storage device. Where the magnetic bearings enclose the motor rotor in the first section, the flywheel rotor in the second section and generator rotor in the third. Where the Motor Generator flywheel rotor magnetic bearing system and method of Torque Enhanced Transmission can be charged and discharged simultaneously. Where the electrical machine is a motor or generator an energy storage device.

Where the system is AC Where the system is DC Where the system combines AC and DC in one machine.

21 Windmill electrical system and power generation system and method using Torque Enhanced Transmission system . a renewable energy source, a Torque generator electrical machine of claim 20, and a drive shaft shaft propulsion power generation energy recovery system of claim 18 attached to a torque-enhanced transmission comprising:

an input shaft

an initial clutch coupled to the input shaft and the first stage shaft;

a first speed stage comprising:

a first stage shaft;

a first speed modulator coupled to the first stage shaft;

a first flywheel coupled to the first stage shaft; and

a first clutch coupled to the first stage shaft; and a first stage lay shaft

A second output shaft connected to first flywheel output shaft

a second speed stage comprising:

a second stage shaft;

a second speed modulator coupled to the second stage shaft;

a second flywheel coupled to the second stage shaft; and

a second clutch coupled to the second stage shaft and a second stage lay shaft ; and

a terminal speed stage comprising:

a terminal stage shaft;

a terminal speed modulator coupled to the terminal stage shaft;

a terminal flywheel coupled to the terminal stage shaft; and

a terminal clutch coupled to the terminal stage shaft;

an output shaft coupled to the terminal speed stage, the output shaft optionally coupled to a final flywheel and optionally coupled to an output device;

an electric drive motor and a drive shaft, the drive shaft coupled to the motor and one of the first or second stage lay shafts; and connected to a generator and a battery.

an electric generator and a drive shaft, the generator connected to the output shaft and the electric drive motor and a system battery.

The Torque enhanced transmission described where speed modulator is interchangeable with speed decreaser\ increaser or gearing wherein the speed increasers speed up the speed of the flywheel to create an increase in kinetic energy and the speed decreaser slows down the speed of the terminal flywheel and the output shaft to provide increased torque and a desired speed of the output shaft.

The torque-enhanced transmission further having a third speed stage comprising:

a third speed increaser coupled to the second speed stage output shaft

a third speed stage flywheel coupled to the third speed increaser; and

a third speed stage output shaft; coupled to

a third speed stage auxiliary lay shaft; and

a third speed stage clutch coupled to the third output shaft;

The torque-enhanced transmission of claim 2 further having a fourth speed stage comprising:

a fourth speed increaser coupled to the third speed stage output shaft;

a fourth speed stage flywheel coupled to the speed increaser; and

a fourth speed stage output shaft; coupled to

a fourth speed stage auxiliary layshaft; and

a fourth speed stage clutch coupled to the third speed stage output shaft and the terminal speed stage speed decreaser.

The torque-enhanced transmission of claim further having a fifth speed stage comprising:

a fifth speed increaser coupled to the fourth speed stage output shaft;

a fifth speed stage flywheel coupled to the fifth speed increaser; and

a fifth speed stage output shaft; coupled to

a fifth speed stage lay shaft; and

a fifth speed stage clutch coupled to the fourth speed stage output shaft and the terminal speed stage speed decreaser.

The torque-enhanced transmission further having a sixth speed stage comprising:

a sixth speed increaser coupled to the fifth speed stage output shaft;

a sixth speed stage flywheel coupled to the sixth speed increaser; and

a sixth speed stage output shaft; coupled to

a sixth speed stage auxiliary lay shaft; and

a sixth speed stage clutch coupled to the fifth speed stage output shaft and the terminal speed stage speed decreaser.

The torque-enhanced transmission of claim further having a seventh speed stage comprising:

a seventh speed increaser coupled to the sixth speed stage output shaft;

a seventh speed stage flywheel coupled to the seventh speed increaser; and

a seventh speed stage output shaft; coupled to

a seventh speed stage auxiliary lay shaft; and

a seventh speed stage clutch coupled to the sixth speed stage output shaft and the terminal speed stage speed decreaser.

The torque-enhanced transmission further having an eighth speed stage comprising:

an eighth speed increaser coupled to the seventh speed stage output shaft;

an eighth speed stage flywheel coupled to the eighth speed increaser; and

an eighth speed stage output shaft; coupled to

an eighth speed stage auxiliary lay shaft; and

an eighth speed stage clutch coupled to the eighth speed stage output shaft and the terminal speed decreaser.

wherein the output device is an induction motor, an induction generator or a combination of the foregoing, wherein the induction motor or induction generator connected to the output shaft and the auxiliary output shafts may be different from one another in the number of magnetic poles in the induction motor or the induction generator. The torque-enhanced transmission according to any one of claims comprising at least one auxiliary torque-enhanced transmission assembly for each speed stage of the torque-enhanced transmission. and an auxiliary output shaft optionally coupled to an auxiliary output device, the auxiliary torque-enhanced transmission being one of claims 1-7. With the output/input device being a water turbine, wind turbine, any generator, fan turbine, jet turbine, ac motor, ac generator, compressed air storage. thermal engine, any fossil fuel motor, hydrogen motor or any combination thereof.

22. The torque-enhanced transmissionaccording to any one of claims 1-21 having at least one auxiliary torque- enhanced electrical machine energy storage device of claim 20 connected to each one speed stage.. And energy is stored in the generators of the lay shaft and delivered back to the main shaft of the torque-enhanced transmission for constant output. A torque enhanced Transmission of claim 1-8, being integrated into a motor generator flywheel magnetic bearings torque enhanced electrical machine to store mechanical energy. Where the motor generator clutches and gears have oversized, weighted rotors that operate as flywheel rotors. and fit inside the housing of the magnetic bearings. Where the rotor has a minimum of three sections and three different speeds. Where the radial bearing is weighted and sized to be an energy storage device. Where the magnetic bearings enclose the motor rotor in the first section, the flywheel rotor in the second section and generator rotor in the third. Where the Motor Generator flywheel rotor magnetic bearing system and method of Torque Enhanced Transmission can be charged and discharged simultaneously. Where the electrical machine is a motor or generator an energy storage device.Where the system is AC. Where the system is DC . Where the system combines AC and DC in one machine. The primary function being energy storage.

23. The Windmill electrical system and power generation method of claim 21 using Torque Enhanced Transmission system of any claim as a mechanical battery for constant output and lay shaft generator, a second generator, a third generator, a fourth generator, a fifth generator, a sixth generator, a seventh generator. Where the generators are primarily kinetic energy storage devices. Where the generators have oversized, weighted rotors to provide energy storage and

operate as flywheel rotors.Where the motor generators have magnetic bearings with oversized and weighted rotors to provide energy storage and supply the main shaft with torque.

24 The method of system of claim 23 and according to any one of claims 1 to 23 where the torque Enhanced Transmission uses an electric drive motor to maintain system speed anaccording to any one of claims 1 to 8d charge the system and the motor gets power from the system battery and generator.

25. The torque-enhanced transmission according to any one of claims 1 to 24, wherein the torque-enhanced transmission operates as a variable speed AC motor or variable speed AC generator. When AC motor generators are attached to each speed stage.

26. A power generation propulsion system system for a motorized vehicle or marine vessel comprising . A torque-enhanced transmission of all claims connected to Windmill electrical system and power generation system and method according to any one claim with A Torque generator electrical machine of claim 20 connected to a lay shaft at each speed stage of torque-enhanced transmission connected to A drive shaft propulsion power generation energy recovery system of claim 19.

27. Where the motorized vehicle is an electric automobile and the system further includes the wheels on the vehicle.

28 .Where the marine vessel of claim 26 is a ship and the system further includes propellers on the ship.

29. The power generation propulsion system system for a motorized vehicle or marine vessel of claim 26 is drivable by an air turbine or fan or water turbine.

28. Where the power generation propulsion system system for a motorized vehicle or marine vessel of claim 29 uses ocean waves and wind power to propel a marine vessel and to generate power to the system using a mechanical driveshaft of electromagnetic propulsion.

30. Where the Torque enhanced Transmission method of any claim , is used in applications requiring enhanced variable torque and a constant low speed output.The torque-enhanced transmission of claim 1, wherein the torque-enhanced transmission is used to provide variable torque at high input speeds and constant rpm, high torque at low input speeds, a constant high rpm output from a low rpm input, an enhanced variable torque, a constant speed output, or a combination of the foregoing.

31. A rotable UPS power system comprising the system of claims 1-20 and connected to an ac source and a battery bank. AC motors and ac generators connected to the battery bus.

32 A solar power inverter apparatus claiming a solar power generation system comprising:

a large commercial size plurality of solar modules generating DC power; further A torque-enhanced transmission according to any one of claims 1-31.

33 The solar power generating system of claim includes a second ac motor where the ac motor maintains a constant speed transmission while the ac generator sends power to the battery and the battery is connected to the generator and ac motor A thermal engine, a dc motor and both motors connected to the Torque Enhanced Transmission of claim 1-29 and the output shaft coupled to an AC grid tied induction motor.

34The thermal engine claims to be heated by solar receivers, collectors, natural gas, from burning coal. And the cold side being cooled from a geothermal method.by air or water, any combination of these or any heat source.

35 A solar power generation system comprising a plurality of solar panels. A solar power generation system of claim having a plurality of motors and generators of different and similar types.

36. Where energy from the system is stored the torque enhanced transmission , torque generator, a flywheel, battery, compressed air tank or in a thermal engine. And in turn the storage devices listed here discharge into the transmission.

37 The solar power generating system of claim 32 is an inverter for large solar farms and inverts DC-to-AC power and the inverter is tied to the electrical grid'.

38. The solar power generating system of claim 32. Wherein the Torque enhanced Transmission is connected to the DC motor that is wired to the solar array and connected to the AC power grid via the AC induction motor of the output shaft.

39. The solar power generating system of claims 24, wherein the DC motor is 12v or any voltage that matches the DC drive motor.

40. A solar power generation system comprising: the transmission of any claim receiving DC power from a plurality of solar modules for generating a solar module output power (SOP) having a solar module output voltage (SOV) and a solar module output current (SOI); and said power is delivered to the DC motor and motor is connected to the transmission.

41. The solar power generation system according to any one of claims 1 to 41, wherein has an ac generator connected to the grid and a dc motor that drives the Transmission and said generator connected to the battery the ac motor connected to the battery and a lay shaft on the transmission.

42. A electrical and Power generation system in an HVAC system comprising motor assembly and connected to the Torque Enhanced Transmission to the HVAC housing wherein the Torque Enhanced Transmission is coupled to an induction generator and to the a compressor that operates in the HVAC housing and operates an AC induction generator

43. Where the system of claim 32 contains a high-speed ups system according to any one of claims 1 to 42 to provide backup standby power to the system and to other loads in the same location and or to be used as smart grid device to store energy.

44. The DC to AC inverter according to any one of claims 1 to 43 and used in solar power system of all claims and used in high speed ups systems to store energy, provide backup power, inverting , transforming power from multiple sources and The Transmission accepts variable input speeds while maintaining constant output speeds and doing this during times of peak loads.

45 The electrical machine UPS system having a Torque Enhanced Transmission according to any one of claims 1 to 44 having magnetic clutch assemblies' magnetic bearings used as flywheel housing and a pony motor and being connected to an ac power source and all motors and generators connected to a DC chemical battery

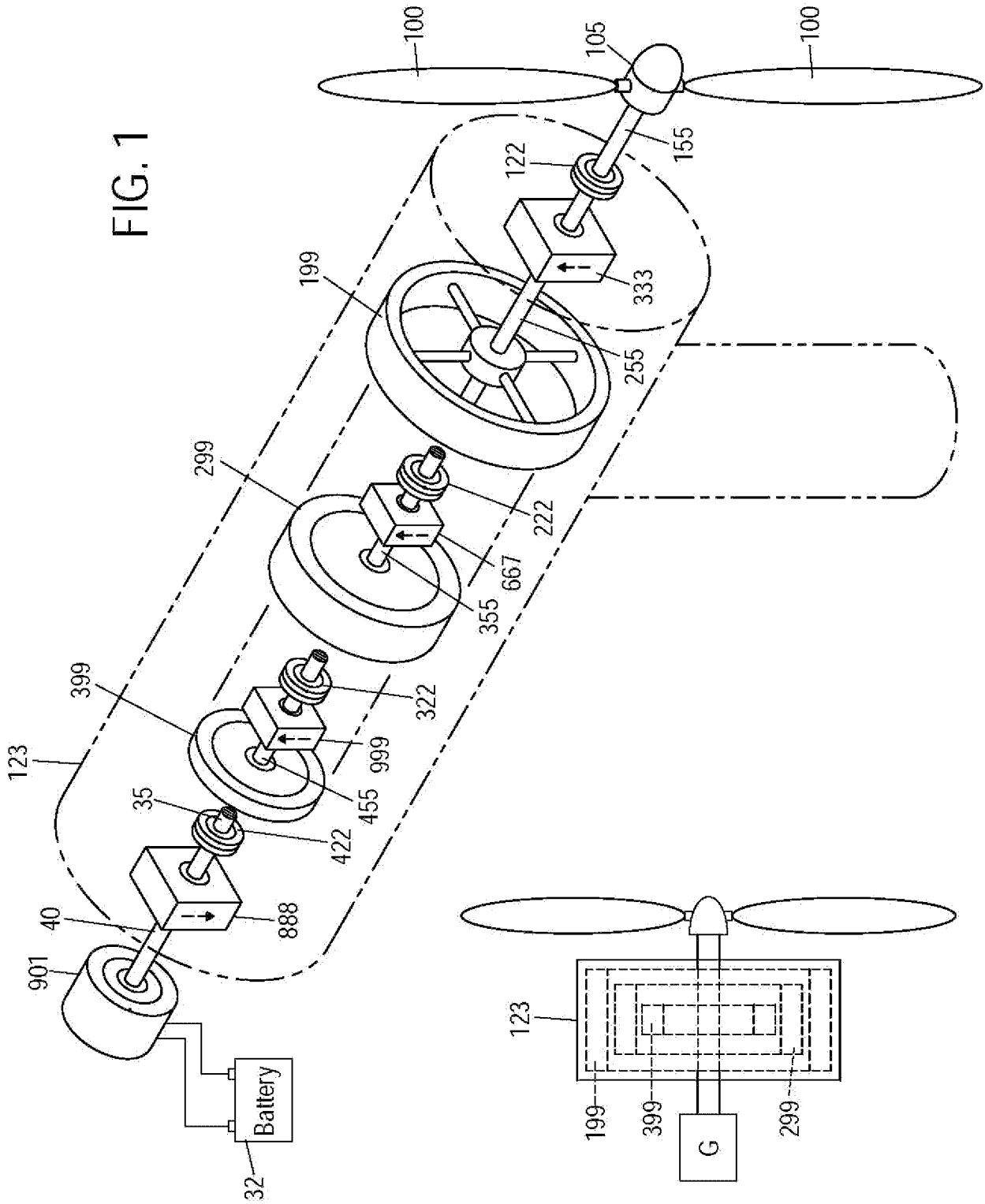
46.The torque-enhanced transmission of claim 1, wherein the torque-enhanced transmission is used to provide variable torque at high input speeds and constant rpm, high torque at low input speeds, a constant high rpm output from a low rpm input, an enhanced variable torque, a constant speed output, or a combination of the foregoing.

47.Where the Torque enhanced transmission system and method of all claims , using clutches to engage/ disengage selectively, speed increasers to speed up flywheels to increase kinetic energy exponentially by reaching speeds that are higher than the application requires, then after the speed decreaser phase the output is constant with enhanced torque. Enhancing torque is achieved by speeding the flywheels to a speed higher than needed by the application, then using speed decreaser(s) to obtain a lower usable and desired output speed while torque is multiplied through down gearing. Where torque is continuously variable and output speeds are relatively constant. Where the transmission provides energy storage and backup power using an integrated storage generator. While multiple speed stages allow for multiple input /output power generation combinations. Where the generators , motors , clutches, and gears have oversized, weighted rotors to provide energy storage. The Torque enhanced Transmission being fit inside magnetic bearings. Where the radial bearing is weighted and sized to contain the flywheel energy storage devices. And energy is stored in the generators of the lay shaft and delivered back to the main shaft.wherein the induction motor or induction generator connected to the output shaft and the auxiliary output shafts may be different from one another in the number of magnetic poles in the induction motor or the induction generator. All systems having a seperate motor generator to charge and discharge simultaneously. The system is a propulsion system, an electric motor, power transmission, power generator, and a universal power bus mechanism.

48. The torque-enhanced transmission of claim 1, wherein the torque-enhanced transmission is a component of a wind-turbine, a propulsion system for motorized vehicles, , a marine or submarine vessel propulsion system, Hybrid electric motorized vehicle propulsion system, , or an electric propulsion system, crushers, electric vehicle systems, traction systems, drilling , mining earth moving systems, oilfield equipment, water pumps, hydraulic variators, air turbines, jet turbines, fan propellers, air compressors, hydroelectric water turbines, electric generator systems, thermal engines, residential HVAC systems, air compressors, backup power systems, portable and home generators, electric car charging stations, electric car regenerative systems, transmissions of wireless power, geothermal power generation, wave generating power

systems, locomotive regeneration and propulsion, electromagnetic propulsion, nuclear power is not needed, elevators, lifts, electrical inverters, electrical transformers, electrical phase converters, mechanical batteries, rotary Ups systems, natural gas power generation, , any rotary device, power tool, and remote power plants,lawn and garden equipment,snowmobiles, dirt bikes, and all-terrain vehicles, forklifts, motors using gasoline or propane, recreational boats and personal watercraft, non-road diesel engines (machinery) in construction and agricultural equipment such as backhoes and tractors. ground support equipment, and heavy forklifts, aircraft engine. an actuation system, a motor system, a traction system, a crushing system, a water pump system, a hydraulic system, a hydroelectric turbine system, an electric generator system, an air compressor system, a residential HVAC system, a back-up power system, a portable generator system, a home generator system, an electric car charging system, an electric car transmission, an internal combustion engine crankshaft HEV and EV transmission, a geothermal power generation system, a wave generating power system, a nuclear power system, an elevator system, a lift system, an electrical inverter, system, an electrical transformer system, an AC DC electrical motor system, and a mechanical battery system, traction systems, drilling motors, crushers, wind generation systems, oilfield equipment, variators, hydraulic pumps, water pumps, hydraulic variators, air turbines, jet turbines, air compressors, water turbines, electric generator systems, power inverters, thermal engines, residential HVAC systems, backup ups power systems, portable generators, electric car charging stations, electric car transmissions, geothermal power generation, wave generating power systems, submarine propulsion, high speed propulsion using magnetic propulsion, elevators, nanotechnology, transmission in trains, high speed rail systems, Ferris wheels, cranes, trains, or multi fuel vehicle EV motors, HEV motors transmissions.

FIG. 1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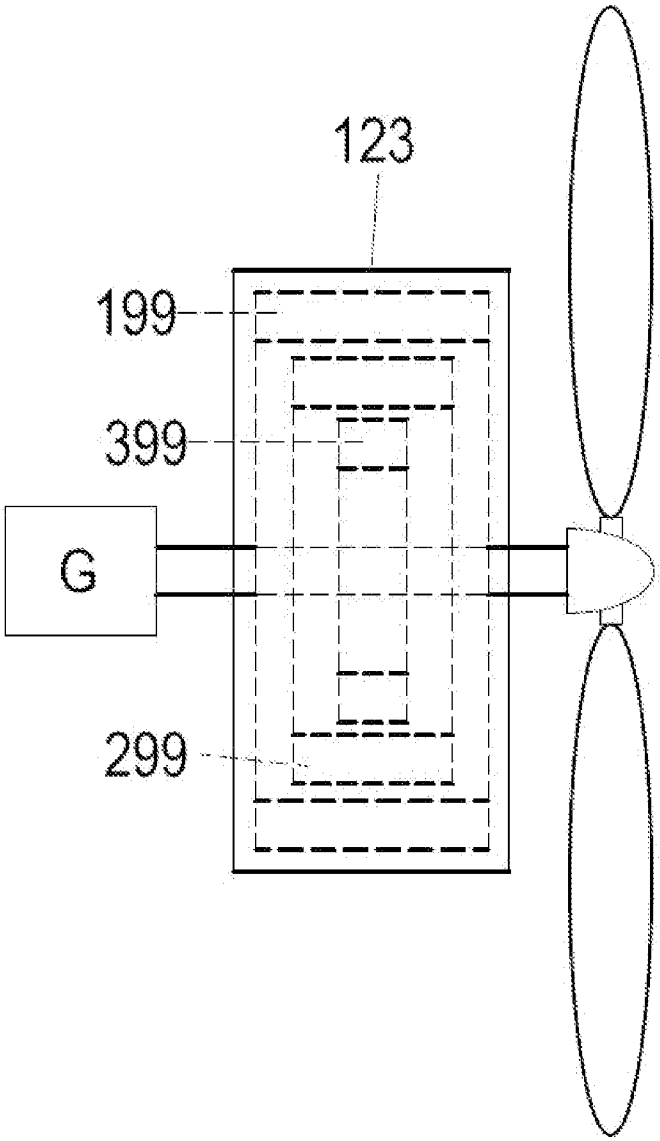

FIG. 1(b)

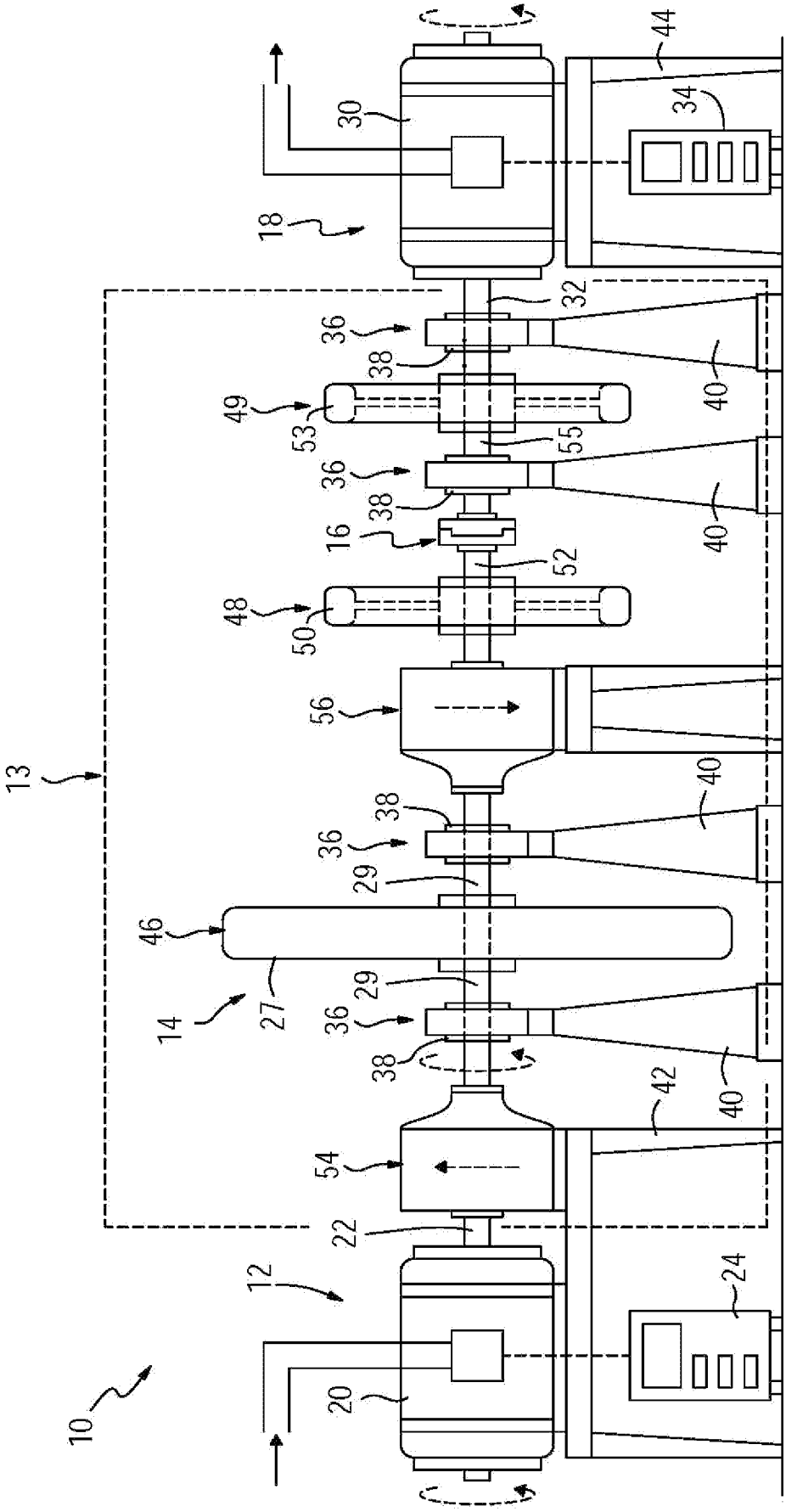
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FIG. 2

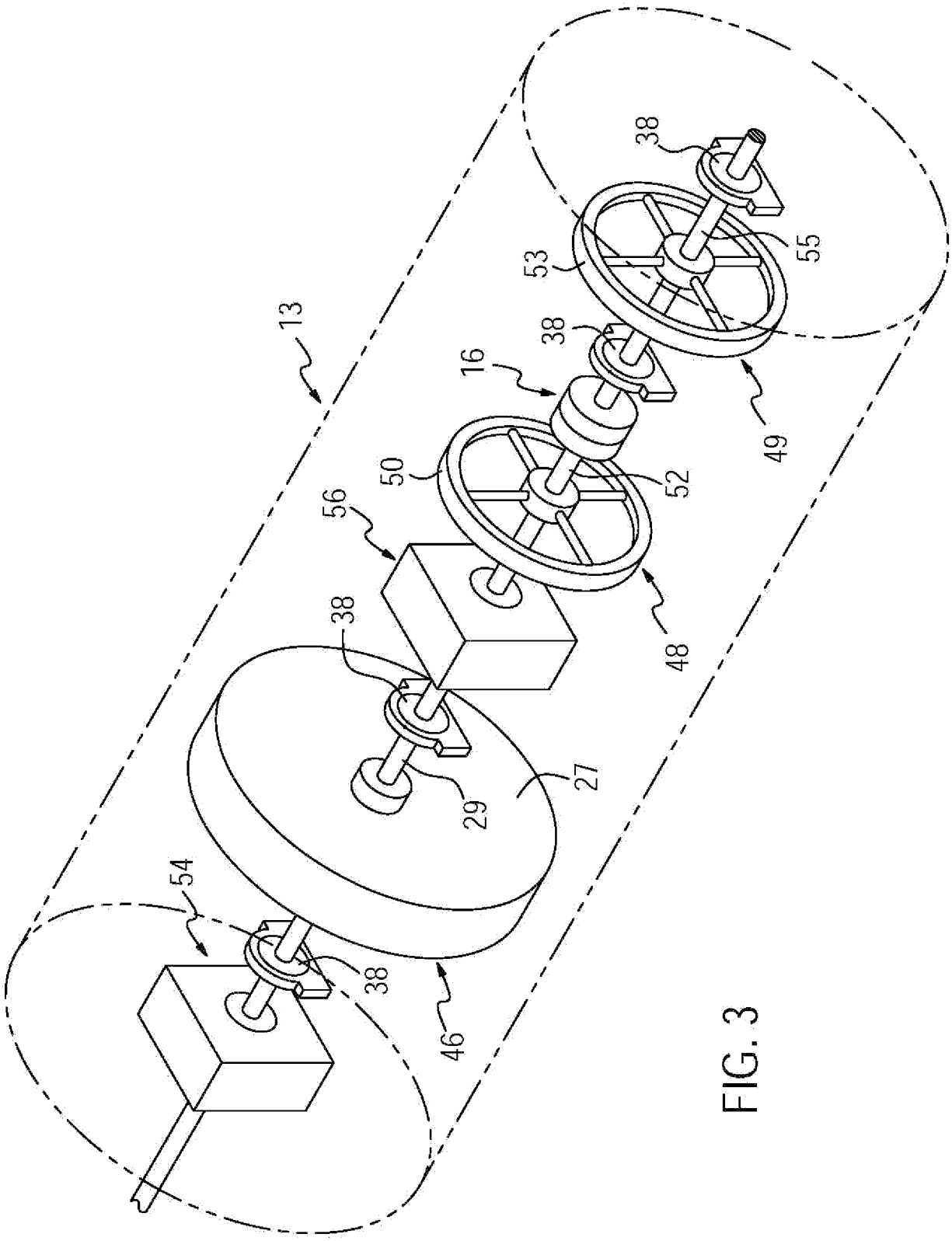
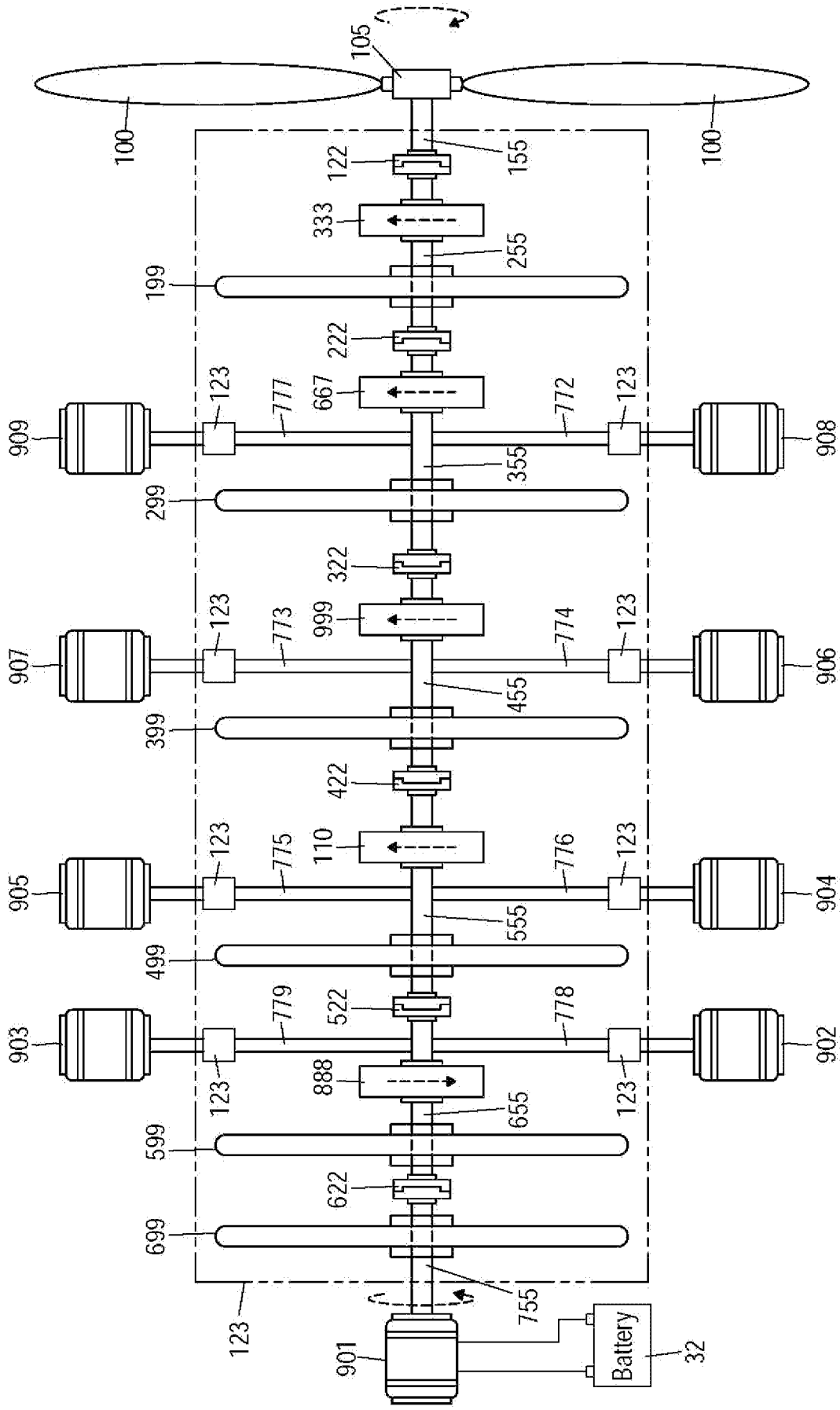


FIG. 3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Battery
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FIG. 4