Patent for electric vehicle flywheel energy storage motor

Is flywheel energy storage system suitable for hybrid electric vehicle?
Simulation results indicate that flywheel energy storage system is quite suitablefor hybrid electric vehicle and with fuzzy logic control strategy both the performance of ICE and ISG are optimized that reduces fuel consumption of vehicle to greater extent. Flywheel energy storage system (FESS) is different from chemical battery and fuel cell.

What is a high-speed flywheel system?
The high-speed flywheel system consists mainly of a flywheel,a motor and a generator. It is connected with exterior electrical systems through input or output electronic equipments and the power transported from exterior systems is converted from electric energy into mechanical energy by raising rotary speed of flywheel.

Why are flywheels used as energy storage devices?
Prior Art The use of flywheels as energy storage devices is ancient art. The flywheel (FW) is an attractive means for storing energy for a number of reasons. In concept,it is a relatively simple device with which energy can be readily stored and extracted,either by mechanical means or by using electric motors and generators.

What is flywheel energy storage system (fess)?
Flywheel energy storage system (FESS) is different from chemical battery and fuel cell. It is a new type of energy storage system that stores energy by mechanical formand was first applied in the field of space industry. With the development of flywheel technology,it is current be widely used in various industry fields.

How flywheel technology is used in automobile industry?
With the development of flywheel technology, it is current be widely used in various industry fields. The vehicle 'AFS20' which was produced by U.S. flywheel system Inc. with original shape of Daimler-Kreisler began the Popularization of FESS towards automobile industry.

How does a flywheel system work?
The Flywheel system is controlled by FCM,which receives commands of charging or discharging from HCU and then gives commands to the motor or generator of FESS. Except for harmonizing functions of all the controllers and determining energy management of vehicle,HCU also needs to deal with various fault signals.

US Patent 5,614,777: Flywheel based energy storage system by Jack Bitterly et al, US Flywheel Systems, March 25, 1997. A compact vehicle flywheel system designed to minimize energy losses. US Patent 6,388,347: ...

7. The flywheel energy storage system according to claim 1, the at least one electric motor assembly further comprises a second motor rotor, the second motor rotor is fixed on an annular internal wall of the annular part and is located in the at least one cavity, wherein another part of the at least one separator located between the

second motor rotor and the ...

Therefore, the flywheel energy storage system can operate as an electric motor or a power generator to directly convert mechanical energy and electrical power. Since the ...

Porsche viewed flywheel storage as more durable than lithium-ion batteries in the extreme power charge/discharge cycles of racing. Unlike a battery, the flywheel motor was capable of being fully ...

For an electric vehicle equipped with a flywheel-lithium battery composite energy storage system, the peak power of the whole vehicle, the peak power of lithium battery and the peak power of the ...

Another proposal for large-scale energy storage implementations is flywheel energy storage systems, which have emerged as an alternative to the above-identified energy storage ...

An example flywheel energy storage device includes a fiber-resin composite shell having an elliptical ovoid shape. The example device also includes an axially oriented internal compressive support between the axial walls of the shell. The example device also includes an inner boss plate and an outer boss plate on each side of the shell.

The optimal design of a super highspeed flywheel rotor could improve flywheel battery energy density. The improvement of flywheel battery energy density could enhance the performance of the flywheel lithium battery ...

One such solution is the electric vehicle flywheel, a technology that offers several advantages over traditional battery-based energy storage systems. ... The device consists of a spinning rotor that is connected to an ...

The Tesla flywheel is evident within its EV business model, which is based on 3 levels of consumer service: selling, servicing, and charging its electric vehicles, which maintains control over ...

The flywheel energy storage system is connected to the power grid without needing to use a power electronic device, so that necessary voltage and frequency support can be ...

Abstract: - A new hybrid-drive system taking flywheel energy storage system instead of chemical battery as assistant power source for hybrid electric vehicle is put forward. ...

Flywheel energy storage (FES) technology, as one of the most promising energy storage technologies, has rapidly developed. ... (rotors), motors, power electronic converters, control systems, and bearings, which play a key role in determining the efficiency of the FESS. ... Patent text mining based hydrogen energy technology evolution path ...

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Flywheel units are organized in clusters. Each flywheel unit has its power electronics, including power converter, motor controller, FPGA. The flywheel size (4-foot/1.2m diameter) is perfectly optimized to fit a cluster of 10 ...

Introducing a novel adaptive capacity energy storage concept based on the Dual-Inertia Flywheel Energy Storage System for battery-powered Electric Vehicles and ...

The invention discloses a magnetic suspension flywheel energy storage motor for an electric car. The magnetic suspension flywheel energy storage motor is characterized in that the external of a rotor core and rotor teeth coaxially sleeve a left stator and a right stator which are arranged in the axial direction; a cylindrical axial magnetization permanent magnet is closely inlaid between ...

A compact energy storage system includes a high speed rotating flywheel and an integral motor/generator unit. The rotating components are contained within a vacuum enclosure to minimize windage losses. The flywheel rotor has a unique axial profile to both maximize the energy density of the flywheel and to maximize the volumetric efficiency of the entire system.

An energy storage system comprises a housing and a flywheel having a drive shaft portion attached to a cylindrical ferromagnetic rotor portion. The drive shaft portion defines a substantially vertical axis about which the rotor portion is mounted for rotation. A magnetic bearing assembly comprised of an annular permanent magnet having no electromagnetic components ...

Energy management strategies are one of the key factors affecting the working efficiency of electric vehicle energy power systems. At present, electric vehicles will develop real-time and efficient energy management ...

Search for Electric Vehicle Patents and Patent Applications (Class 701/22) Filed with the USPTO ... There is provided a power supply device that supplies electric power to a motor-driven vehicle including a power storage device through one of wireless supply of electric power using a wireless system and wired supply of electric power using a ...

Electric flywheel energy storage system powers Porsche 911 hybrid electric vehicle (HEV) to endurance racing victory. ... The electricity generated by the flywheel is fed back to the motors on the driveline during times of high ...

The kinetic energy stored in a one tonne vehicle at 70 mph (V veh = 31.3 m/s) is 489 kJ.If the flywheel is assumed to be a thin-walled hollow cylinder of steel with a feasible mean speed of the steel of 300 m/s, the mass of the flywheel needed to store the same energy as this vehicle is only 10.9 kg.This approximate calculation assumes a stress of 720 MPa and the ...

When energy is required, the motor functions as a generator, because the flywheel transfers rotational energy

to it. This is converted back into electrical energy, thus completing the cycle. As the flywheel spins faster, it experiences ...

Today, flywheel energy storage systems are used for ride-through energy for a variety of demanding applications surpassing chemical batteries. ... The main components of a flywheel are a high-speed permanent magnet ...

Flywheel Energy Storage System (FESS) Revterra Kinetic Stabilizer Save money, stop outages and interruptions, and overcome grid limitations ... designed to mitigate demand charges and infrastructure upgrade ...

Key-Words: - Flywheel energy storage system, ISG, Hybrid electric vehicle, Energy management, Fuzzy logic control 1 Introduction Flywheel energy storage system (FESS) is different from chemical battery and fuel cell. It is a new type of energy storage system that stores energy by mechanical form and was first applied in the field of space industry.

A flywheel energy storage system (10) includes a vacuum enclosure (18) having a flywheel (12), motor/generator (14), and a shaft (16) enclosed within. The flywheel and motor/generator combination are designed to minimize bearing loads and ...

Flywheel energy storage systems (FESSs) are classified based on power capacity and discharge time. New FESSs have significantly reduced energy losses and manufacturing costs and are able to work for several hours in a row (Amber kinetics, 2017). They offer high disabilities and fast responses and are not very sensitive to temperature or humidity.

Flywheel energy storage motor patent Flywheel energy storage device. Patent number: 12078221. Abstract: An example flywheel energy storage device includes a fiber-resin ...

A doubly salient permanent magnet (DSPM) motor flywheel energy storage for building integrated photovoltaic (BIPV) system was simulated in 2001. By adding a flywheel to a BIPV equipped building situated in Hong Kong, the load supply time can be prolonged from 9 a.m. to 3 p.m. to 8 a.m.-beyond 6 p.m. [36].

Air electric vehicle US7802641B2 (en) * 2008-02-11: 2010-09-28: John Friedmann: Wind-powered, battery-energized electric vehicle US8598838B2 (en) * 2008-04-09: 2013-12-03: Michele Cunico: Electric vehicle having a battery configured for recharging via an on-board generator powered by renewal energy sources

In recent years, there has been a great deal of interest in reducing the weight and size of flywheel based energy storage devices to provide such a device that can be practically utilized as...

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