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.

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.

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 ...

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Chakratec flywheel-based Kinetic Energy Storage systems for EV charging, grid-balancing With flywheel technology--which the company terms a kinetic battery--Chakratec allows the deployment of ...

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 ...

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 ...

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

However, range remains an issue so that further research was started on additioual flywheel range-extending systems. The paper reports first resnlts of the flywheel system investigations. With a flywheel operation speed of 40 000 rpm basic effects of ...

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 ...

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: ...

The flywheel energy storage system (FESS) offers a fast dynamic response, high power and energy densities, high efficiency, good reliability, long lifetime and low maintenance requirements, and is ...

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 motor-generator assembly usually called ... Calvert, W., Electrical power syste m, US Patent 3497026 ... An assessment of flywheel energy storage for electric vehicle, ...

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

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The power conversion device has the advantages that the energy bidirectional flowing of the flywheel energy storage system can be realized; the four-quadrant operation of a high-speed flywheel energy storage motor can be realized; the energy feedback circuit is used, so that the utilization rate of energy is greatly improved; the operation ...

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 ...

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].

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 ...

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 ...

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 ...

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 ...

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...

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 ...

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.

Search for Power Generating-type Flywheel Patents and Patent Applications (Class 74/572.1) Filed with the USPTO Abstract: A high speed flywheel system, including a flywheel mounted ...

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 ...

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 ...

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 ...

A flywheel energy storage system for a vehicle, comprising a first shaft, a second shaft operatively coupled to the first shaft and to the vehicle"s drivetrain, a flywheel operatively coupled...

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 ...

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 ...

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 ...

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.

Web: https://fitness-barbara.wroclaw.pl

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