Flywheel energy storage patent

What is a flywheel energy storage assembly?
The flywheel energy storage assembly includes a flywheel rotatably disposed in a flywheel housing, a fluid source, a braking actuator in fluid communication with the fluid source and an interior of the flywheel housing, a sensor, and a controller in communication with the sensor and the braking actuator.

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.

How to reduce unnecessary turbine starts in a flywheel energy storage system?
In yet a further embodiment of the disclosure a method is provided for reducing unnecessary turbine starts by making turbine start a function of the rotational velocity of a flywheel. Abstract: A crash management system for implementation in a flywheel energy storage system (FESS) is provided.

What is a flywheel gimbal system?
Abstract: A flywheel system has damped gimbal system suspending a motor generatorwhich is in turn linked by means of any number of flexible couplings and rigid shafts to a flywheel rotor system so as to provide safe passive stability to the highly energized spinning rotor system and high torque transmitting capacity.

What is a flywheel assembly?
A flywheel assembly comprising: a cylindrical sleevecarried on said shaft,said sleeve closed at each of two opposing axial ends to define an enclosed volume; wherein said sleeve is deformed by expansion of said fluid within said enclosed volume to tightly engage said rotor.

What is a flywheel rotor?
The flywheel rotor has a unique axial profile to both maximize the energy density of the flywheel, to maximize the volumetric efficiency of the entire system and to provide a circumferential ridge to add balance weights without the damaging procedure of grinding away fibers.

-05 Priority to DE102013222445.1A priority Critical patent/DE102013222445A1/en 2014-07-31 Publication of DE102013222445A1 publication Critical patent ... Flywheel mass storage in motor vehicles serve the preferably short-term storage of kinetic energy. The flywheel is coupled via a transmission with the vehicle drive and is, for example ...

Increasing the flywheel energy storage by adding mass becomes a challenge on three fronts. First, the flywheel energy storage capacity increases linearly with the increase in flywheel...

This innovation, patented on June 19, 2024, at the Boudhik Sampada Bhavan in Kolkata and published in the

Flywheel energy storage patent

National Official Journal of the Patent Office on July 5, 2024, is titled "A Process to Make Over Unity ...

Flywheel energy storage (FES) technology, as one of the most promising energy storage technologies, has rapidly developed. It is essential to analyze the evolution path of advanced technology in this field and to predict its development trend and direction. ... Second, the time series of academic papers and patents filed in the last two decades ...

This invention relates to flywheel energy storage systems, to integration of advanced-technology fiber-reinforced composite thick-ring flywheels, low-cost continuous-filament unbonded steel...

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...

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 invention discloses an energy storage flywheel, which comprises a shell, a rotor assembly and a motor assembly, wherein the shell is provided with a vacuum chamber, the rotor assembly is rotatably arranged in the vacuum chamber and comprises a shaft, a plurality of support rods and a carbon fiber ring, the carbon fiber ring is sleeved on the shaft, and the inner peripheral ...

The kinetic energy flowing from the KAMMA gear flywheel is always more than the opposing kinetic energy coming as a reverse torque from the pinion gear wheel when load is applied on the generator. All three i.e. KAMMA gear flywheel, pinion gear wheel, generator are connected with each other and continuously rotating with their individual RPMs ...

This page includes the patent name, patent number, legal status, invention/applicant, technical efficacy and accompanying drawings of Flywheel energy storage-related invention patents and ...

An electrical energy storage system for supplying power to a load comprises a plurality of flywheel energy storage systems, each supplying a power output signal, and a connector circuit. The connector circuit connects the flywheel energy storage systems to the load, but the flywheel energy storage systems are not connected to each other.

The disclosure relates to a flywheel energy storage system including a casing, shaft, flywheel, and electric motor assembly. The casing has an inner vacuum chamber, at ...

Flywheel Energy Storage (FES) systems refer to the contemporary rotor-flywheels that are being used across many industries to store mechanical or electrical energy. Instead of using large iron wheels and ball bearings, ...

Flywheel energy storage patent

In flywheel based energy storage systems (FESSs), a flywheel stores mechanical energy that interchanges in form of electrical energy by means of an electrical machine with a bidirectional power converter. FESSs are suitable whenever numerous charge and discharge cycles (hundred of thousands) are needed with medium to high power (kW to MW ...

Flywheel energy storage battery systems are a very old technology, but they have gained new life thanks to recent developments in rotary motors, including non-contact magnetic bearings and permanent magnet motors/generators using new strong magnetic materials (NdFeB and SmCo). The flywheel energy storage battery system is mainly composed of an

An elevator system, having a three phase rectifier (20) which converts energy from a three phase AC main (21) to provide DC power on a bus (19) to a three phase inverter (18) that drives a three phase inductive hoist motor (17), utilizes regenerated energy applied (46, 47) to a boost regulator (52) to drive (54, 55) a flywheel motor generator (26) to store the regenerated energy in the ...

A flywheel based energy storage apparatus includes a housing and a hub-less flywheel mounted within the housing. The hub-less flywheel has a mass which is shifted radially outwards from a central axis of the hub-less flywheel thus increasing the energy density of the apparatus. The flywheel includes an outer axially extending annular surface, an inner axially ...

The flywheel energy storage system according to the present invention includes a flywheel having a high mass energy density. Thus, by using the flywheel with a reduced weight, the weight of ...

What is claimed is: 1. An electrical energy storage system for supplying power to a load comprising: a. a plurality of flywheel energy storage systems, each supplying a power output signal, each of said flywheel energy storage systems comprising: i. a flywheel turning at an initially predetermined rate; ii. a motor/generator coupled to said flywheel; iii. a bi-directional inverter ...

A hybrid/electric vehicle power management system in which an Inertial Storage and Recovery System (INSTAR) utilizes an enhanced Flywheel Energy Storage (FES) system to reach higher vehicle efficiencies. INSTAR allows regenerative braking energy surges to be readily stored at high efficiency on the flywheel, whose energy is then converted to power for driving the ...

The shaft-less energy storage flywheel system includes a solid cylindrical flywheel having permanent motor magnets mounted about the flywheel. The shaft-less energy storage flywheel system also includes a motor stator having motor windings carrying electrical currents. ... 2011-09-13 Priority to US13/231,720 priority Critical patent/US8633625B2/en

Flywheel batteries, a new concept of energy storage devices, push the limits of chemical batteries and achieve physical energy storage through the high-speed rotation of a flywheel [1] [2] [3 ...

Flywheel energy storage patent

An optimized flywheel energy storage system utilizing magnetic bearings, a high speed permanent magnet motor/generator, and a flywheel member. The flywheel system is constructed using a high strength steel wheel for kinetic energy storage, high efficiency magnetic bearings configured with dual thrust acting permanent magnet combination bearings, and a high ...

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 ...

A flywheel energy storage battery includes two solid steel flywheels free of axial through holes and axially spaced apart at their outer diameter, forming an airgap between the flywheels, and coupled together closer to the center. A bearing system supports the flywheels for rotation about a vertical axis inside a sealed container, and a motor-generator that is integrated with the ...

An example flywheel energy storage device includes a continuously curved fiber-resin composite ovoid shell. Hubs are concentrically disposed within and outside the shell at the shaft. A plurality of radially oriented, fiber-resin composite helical wraps of uniform width are used to construct the ovoid shell and couple the shell to the hubs for co-rotation and torque transfer.

Pic Credit: Energy Storage News A Global Milestone. This project sets a new benchmark in energy storage. Previously, the largest flywheel energy storage system was the Beacon Power flywheel station in Stephentown, New ...

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 ...

By utilizing the aforesaid novel fabrication techniques, a preferred embodiment of a unitary, thick flywheel rim achieves radial stress reduction to trivial levels and hoop stress equalization ...

A flywheel uninterruptible power supply has an energy storage flywheel supported in a low pressure containment vessel for rotation on a bearing system. A brushless motor/generator is coupled to the flywheel for accelerating and decelerating the flywheel for storing and retrieving energy. The flywheel is rotated in normal operation at a speed such that the generator voltage ...

The super-flywheel energy storage comprises heat exchangers, which exhaust heat released by windings and magnetic conductors of the stator. For emergency braking there is a braking device made of braking electric coils and a braking disc, role of which is performed by the rotor disc. ... 2010-02-24 Priority to RU2010106535/07A priority Critical ...

Techniques for flywheel energy storage devices including magnetic bearings and/or magnetic drives are

generally disclosed. Some example magnetic bearings may include a flywheel magnet and a support magnet arranged to magnetically suspend a rotating flywheel. Some example magnetic drives may include at least one drive magnet arranged to magnetically engage a ...

Web: https://eastcoastpower.co.za