Sujiaoke flywheel energy storage patent

A review of energy storage types, applications and recent developments. S. Koohi-Fayegh, M.A. Rosen, in Journal of Energy Storage, 2020 2.4 Flywheel energy storage. Flywheel energy storage, also known as kinetic energy storage, is a form of mechanical energy storage that is a suitable to achieve the smooth operation of machines and to provide high power and energy ...

Energy storage devices can help rectify the mismatch between generation and demand at any loading condition. Such devices can also provide some ancillary services, such as frequency regulation, voltage support, power quality improvement, transmission congestion relief, and system upgrade deferral. This paper presents an overview of the flywheel ...

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 ...

Flywheel energy storage . According to [10,[23][24][25][26],the flywheel stores kinetic energy of rotation, and the stored energy depends on the moment of inertia and the rotational speed of the flywheel.

The operation of the electricity network has grown more complex due to the increased adoption of renewable energy resources, such as wind and solar power. Using energy storage technology can improve the stability and quality of the power grid. One such technology is flywheel energy storage systems (FESSs). Compared with other energy storage systems, ...

JAMSHEDPUR - Saumya Deep, who is a mechanical engineer and school administrator, recently made an exciting announcement about a potentially revolutionary invention in flywheel energy storage technology. Deep"s patent, titled "A Process to Make Over Unity Efficiency Flywheel," was officially registered on June 19, 2024, in the city of Kolkata.

A spherical flywheel is described and specified that stores rotational energy more efficiently than cylindrical flywheels. The spherical flywheel is composed of multiple layers of material with the densest material at the surface. The flywheel surface is dimpled with a pattern similar to golf ball surfaces, to minimize aerodynamic drag.

The Portable Multi-stack Flywheel Energy Storage Assembly stores energy from any electrical grid or other energy source such as wind turbines and photovoltaic solar power to a flywheel assembly. The invention is comprised of a motor/generator with a combination of multi-stacked flywheels, positive locking roller stops and speed activated ...

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 ...

In this paper, state-of-the-art and future opportunities for flywheel energy storage systems are reviewed. The FESS technology is an interdisciplinary, complex subject that ...

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 global flywheel energy storage market size was valued at USD 339.92 million in 2023. The market is projected to grow from USD 366.37 million in 2024 to USD 713.57 million by 2032, exhibiting a CAGR of 8.69% during the forecast period. Flywheel energy storage is a mechanical energy storage system that utilizes the ... Learn More

The anatomy of a flywheel energy storage device. Image used courtesy of Sino Voltaics . A major benefit of a flywheel as opposed to a conventional battery is that their expected service life is not dependent on the number of charging cycles or age. The more one charges and discharges the device in a standard battery, the more it degrades.

Flywheel Energy Storage Application Example . 3.4K views 3 years ago. In applications with dynamic duty cycles, generator sets are sized for the dynamic load response However, most of the time these generators are operated at a fraction of

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 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 ...

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 ...

The invention aims to solve the technical problems of the prior art, and provides an energy storage flywheel which can convert kinetic energy of a flywheel rotor into elastic potential energy of a coil spring and store the elastic potential energy after power failure, and when a magnetic bearing control module cannot receive electric energy from an inverter, the elastic potential ...

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 motors, ...

Our flywheel will be run on a number of different grid stabilization scenarios. KENYA - TEA FACTORY. OXTO will install an 800kW flywheel energy storage system for a tea manufacturing company in Kenya. The OXTO flywheel will operate as UPS system by covering both power and voltage fluctuation and diesel genset trips to increase productivity.

Mathematical models of the train, driving cycle and flywheel energy storage system are developed. These models are used to study the energy consumption and the operating cost of a light rail transit train with and without flywheel energy storage. Results suggest that maximum energy savings of 31% can be achieved using a flywheel ... Discover More

Fig. 1 has been produced to illustrate the flywheel energy storage system, including its sub-components and the related technologies. A FESS consists of several key components: (1) A rotor/flywheel for storing the kinetic energy. (2) A bearing system to support the rotor/flywheel. (3) A power converter system for charge and discharge, including ...

This paper presents an overview of the flywheel as a promising energy storage element. Electrical machines used with flywheels are surveyed along with their control techniques. Loss minimization ...

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: Flywheel battery system with active counter-rotating containment by H. Wayland Blake et al, Trinity Flywheel Power, May 14, 2002. A ...

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 ...