

# Flywheel energy storage related patents

What is a flywheel energy storage system?

A flywheel energy storage system is a type of energy storage system where the power and energy capacity can be independently sized for each application. Near-term applications include on-site or user-site storage, rather than utility storage directly. Future possibilities include solar and wind power applications.

Is flywheel energy storage commercially viable?

This project aimed to advance flywheel energy storage technology to commercial viability for utility scale energy storage. To achieve this, the design, manufacturing capability, system cost, storage capacity, efficiency, reliability, safety, and system level operation of flywheel energy storage technology were all addressed in the R&D.

What happened to flywheel energy technology?

Interest in flywheel energy technology fell as oil prices stabilised towards the end of the 1970s, leading to a reduction in research. The research into flywheels petered out by the mid 1980s. However, there was a revival in the 1990s due to stricter emissions legislation coming into force worldwide.

Are composite flywheels a viable alternative to energy storage?

Composite flywheels, as a type of flywheel technology for energy storage, are still in their infancy. Their full benefit will become apparent in the future due to ongoing development efforts.

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.

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 ...

An example flywheel energy storage (FES) device 10 may include a rotating or rotatable flywheel 12, which may be suspended by a magnetic bearing 14 and/or which may be adapted to store energy as rotational kinetic energy. Energy may be supplied to or withdrawn from flywheel 12 by a magnetic drive 16, which may be operatively coupled to an input/output device 18, such as a ...

A flywheel support system isolates the flywheel and its motor-generator from the driving environment of an electrically powered motor vehicle. A suitable liquid, placed between the outer and vacuum housings of the flywheel assembly, provides buoyancy and damping to the vacuum housing, cooling of the motor-generator,

and serves as one of the barriers to rotor energy and ...

In addition, when there is no energy exchange to/from the shaft-less energy storage flywheel system 18, the motor stator 24 may be removed entirely from the shaft-less energy storage flywheel system 18 (or moved substantially away from the flywheel 20) to reduce the motor losses to substantially zero, thereby improving the efficiency of the ...

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 invention discloses an electro-hydrostatic-flywheel hybrid energy storage unit. The invention comprises a flywheel, a storage battery, a motor controller, a motor, a hydraulic pump motor and a hydraulic oil tank; the storage battery is electrically connected with the motor through the motor controller, the output shaft of the motor is coaxially connected with the output shaft of the ...

Accordingly, the invention provides a speed control for a flywheel energy storage system that provides accurate and reliable speed control for long-term operation. The speed control uses a current limiting means that safely limits the acceleration current to the motor for accelerating flywheel, and a rate controller that digitally switches the acceleration current on and off to ...

A flywheel energy storage device containing at least one rotary element ( 1 ) which is capable of floating and rotating on liquid and/or in liquid, at least one element which is capable of transferring energy onto the rotary element ( 1 ) and at least one generator ( 3 ) which is capable of transferring the energy from the rotary element ( 1 ) wherein the rotary element ( 1 ) is axleless.

In the related art, the energy storage flywheel utilizes the magnetic bearing to suspend and support the flywheel rotor, and during normal operation, the magnetic bearing control module supplies power through an external power grid, when the external power grid is powered off, the energy of the flywheel can utilize the inverter to provide electric energy for the magnetic ...

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 is ...

in the related technology, the hub material of the energy storage flywheel is metal and alloy, the rim material is fiber composite material with higher specific strength, the rim is pressed on the hub with a certain interference, and the strength of the flywheel in a high-speed rotation state must meet the material strength requirement while the flywheel stores energy to reach the maximum ...

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 present invention provides a kind of high-speed magnetic levitation flywheel energy storage device, and casing is vertical to be installed on base, cabinet top installation top end cover; Stator is vertical to be installed on top end cover lower part; Rotor is coated on outside stator; Rotor radial is integrated with rotor; It is used for radial support equipped with passive ...

a flywheel energy storage device was constructed according to the Example no. 5 and 6 except that this flywheel energy storage device is performed around the natural island where the coast of the island forms the basis for anchoring the stator 6. In case that the island has non-circular shape, the stator 6 can interfere with water level in some ...

Repulsive lift systems, flywheel energy storage systems utilizing such systems and methods related thereto US7679245B2 (en) 2001-09-17: 2010-03-16: Beacon Power Corporation: Repulsive lift systems, flywheel energy storage systems utilizing such systems and methods related thereto US7268454B2 (en) \* 2003-01-17: 2007-09-11

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 ...

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