

Gravity energy storage patent application

What is gravity energy storage technology?

The most widely used scenario of gravity energy storage technology is wind power generation system, followed by solar power generation system and ocean power generation system. In addition, there are geothermal, hydro-energy, bioenergy and hydrogen generation system.

How many patents are there in gravity energy storage?

The paper data utilized in this research was extracted from the Clarivate Analytics company's WoS Core Collection database (SCI-Expanded). The search strategy was based on the association of keywords related to gravity energy storage. By June 2023, 1166 patents and 82 SCI papers were retrieved.

When was gravity energy storage invented?

The first patent application for gravity energy storage technology was filed by Tah Sun Lin in the USA in 1974, providing a device for harnessing wave energy and storing the energy in the form of potential energy for subsequent use in driving various machines.

Can gravity energy storage solve the problem of new energy consumption?

The bi-directional charging and discharging functionality of energy storage systems can effectively solve the problem of new energy consumption. Gravity energy storage (GES) is a kind of physical energy storage technology that is environmentally friendly and economically competitive.

Does gravity energy storage technology need technological breakthroughs?

The results of paper analysis show that the global output of gravity energy storage technology patents and papers continues to grow steadily, which is at the initial stage of commercialization, still needs technological breakthroughs.

How can gravity energy storage help a wind power generation system?

By integrating gravity energy storage technology, the wind power generation system can work in a wider wind speed range, or it can be stored when the wind is sufficient or the electricity is low, to ensure a stable power supply.

Solid Gravity Energy Storage: A review Wenxuan Tong^{a,b} ... the SGES's possible application scenarios and market scale assessment are presented based on SWOT analysis. ... public patents (search by ...

The invention discloses a gravity energy storage system utilizing the ocean depth drop. The system comprises a single point mooring device fixed to the plane of a seabed, a large floating body, a plurality of standard weights and a control system, wherein the standard weights are stacked on the large floating body and the plane of the seabed; at least two sets of evenly ...

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The Gravity energy storage and generating device, main object of the invention is to provide improved mechanical energy storage and release device comprising of the wound and weight energy storing elements. ... 2010-10-08 Application filed by Individual filed Critical Individual 2010-10-08 Priority to US12/924,961 priority Critical patent ...

Existing mature energy storage technologies with large-scale applications primarily include pumped storage [10], electrochemical energy storage [11], and Compressed air energy storage (CAES) [12]. The principle of pumped storage involves using electrical energy to drive a pump, transporting water from a lower reservoir to an upper reservoir, and converting it ...

2017-07-11 Publication of US9701387B2 publication Critical patent/US9701387B2/en 2017-07-11 Application granted granted Critical 2018-02-27 Assigned to STRATOSOLAR, INC ... The gravity energy storage system described is unique in that it exploits buoyancy in the atmosphere to support a large mass and the height of approximately 20 km is much ...

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Most TEA starts by developing a cost model. In general, the life cycle cost (LCC) of an energy storage system includes the total capital cost (TCC), the replacement cost, the fixed and variable O& M costs, as well as the end-of-life cost [5]. To structure the total capital cost (TCC), most models decompose ESSs into three main components, namely, power conversion ...

The present invention provides novel designs and improved methods for the construction and operation of a gravity powered energy storage facility. This facility might also ...

2018-09-24 Priority to US16/140,520 priority patent/US10677227B2/en 2018-11-27 Application granted granted Critical 2018-11-27 Publication of US10138875B2 publication Critical patent/US10138875B2/en ... The Gravity Field Energy Storage & Recovery System [GFESRS] invention is a mechanical, electrical and electronic system that has the ability to ...

Gravity energy storage (GES) is an innovative technology to store electricity as the potential energy of solid weights lifted against the Earth's gravity force. When surplus electricity is available, it is used to lift weights. ... (2020) Industrial System for Energy Storage, Energozapas LLC, Patent No. US10833533B2; 12/27/2018; 02/06/2020 ...

Justia Patents US Patent Application for GRAVITY-BASED ENERGY-STORAGE SYSTEM AND METHOD Patent Application (Application #20150130191) ... More relevant to the current invention is a 2010 patent application by Morgan (US2010/0107627) where the concept of submerging a buoyant volume under water is introduced. This being the reverse process of ...

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Gravity energy storage is a kind of physical energy storage with competitive environmental and economic performance, which has received more and more attention in recent years. This paper introduces the working principle and energy storage structure of gravitational potential energy storage as a physical energy storage method, analyzes in ...

It was seen that patent filings in gravity based energy storage systems has been, on average, increasing year-on-year. 2023 was also full of commercial developments and brought news that Gravitricity and Energy Vault are moving forward with commercialising gravity energy storage systems around the world; Gravitricity are partnering with ABB and ...

This patent application describes a "Device" entitled "Gravity Engine" that extracts energy from gravity and buoyancy and converts this into energy of another form, for example, Electrical energy. Devices using similar principles of operation described have potential to be scaled from very small to large scale electrical or other energy production to suit individual applications.

Our GraviStore underground gravity energy storage technology uses the force of gravity to offer some of the best characteristics of lithium batteries and pumped hydro storage. Hydrogen Storage Our H₂ FlexiStore underground hydrogen storage technology uses the geology of the earth to contain pressurised fuel gas, allowing safe, large-scale ...

2013-03-14 Priority claimed from US13/831,004 external-priority patent/US8985499B2/en 2020-01-29 Application filed by Stratosolar Inc filed Critical ... The gravity energy storage system described is unique in that it exploits buoyancy in the atmosphere to support a large mass and the height of approximately 20 km is much larger than the ...

Skyline Starfish: Energy Vault's concept demonstrator has been hooked to the grid in Ticino, Switzerland, since July 2020. By raising and lowering 35-metric-ton blocks (not shown) the tower stores ...

gravity storage units with capacities higher than 1 MWh, providing 0.804 GWh of energy storage. This system is based on the assumption that the suspended weights are limited to 3000 metric tons ...

In the aspect of the system which aid the storage of energy by gravity, the aforementioned geared motor is mounted on a foundation connected to the spindle of a solenoid which does a reciprocating ram motion to give the geared motor a transverse motion back and forth to fit the geared motor shaft into a hollow shaft connected to an intermediate pulley when ...

Justia Patents US Patent Application for GRAVITY FIELD ENERGY STORAGE AND RECOVERY SYSTEM Patent Application (Application #20200217303) GRAVITY FIELD ENERGY STORAGE AND RECOVERY SYSTEM . Feb 26, 2020. Device for storing energy, using a physical object, such as a mass or buoyant object floating in fluid. A mass is repositioned to ...

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the Gravity Field Energy Storage & Recovery System invention is a mechanical, ... Information on status: patent application and granting procedure in general: Free format text: RESPONSE TO NON-FINAL OFFICE ACTION ENTERED AND FORWARDED TO EXAMINER. 2019-07-26: STPP:

The invention provides a gravity energy storage system based on a vertical shaft and a roadway, which comprises a vertical shaft (1), the roadway (2), an upper track (3), a lower track (4), a supporting beam frame (5), a motor generator (6), a winch (7), a car (8) and n weight carriers (9); under the working condition of energy storage, a heavy object carrier (9-n) moves to the inside ...

The invention discloses a gravity energy storage system based on multi-object efficient lifting and transferring, which comprises a vertical shaft (1), a roadway (2), an upper weight storage warehouse (3), a lower weight storage warehouse (4), a support beam frame (5), an electric hoist (6), a car (7), an AGV forklift (8) and n weight carrier modules (9); under the working condition ...

Applications of Gravity Energy Storage Technology. Grid Stabilization: Gravity-based energy storage technology systems can help stabilize the grid by storing excess energy during periods of low demand and releasing it when demand peaks, thus reducing the need for costly peaker plants and enhancing grid reliability.; Renewable Integration: By providing a ...

Then follows an analysis of the practical applications of gravity energy storage in real scenarios such as mountains, wind farms, oceans, energy depots and abandoned mines, and finally an outlook ...

2013-03-14 Priority claimed from US13/831,004 external-priority patent/US8985499B2/en 2017-06-01 Application filed by Stratosolar Inc filed Critical ... The gravity energy storage system described is unique in that it exploits buoyancy in the atmosphere to support a large mass and the height of approximately 20 km is much larger than the ...

[0014] More relevant to the current invention is a 2010 patent application by Morgan (US2010/0107627) where the concept of submerging a buoyant volume under water is introduced. ... compared to other sources and methods of obtaining the hundreds of millions of pounds needed for cost-effective gravity-based energy storage. In still other ...

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