Energy storage special-shaped parts

The above special-shaped ... [49] extended the heat conduction in the lower parts of the unit and strengthed the convective natural convection in the upper region using the gradient tree-shaped longitudinal fins in the horizontal LTES unit. ... Thermal energy storage plays a crucial role in the efficient use of solar energy and the recovery of ...

The distinctly shaped steel-reinforced concrete (SRC) column-beam framing system offers an innovative and tailored structural solution that combines load-bearing capabilities with architectural esthetics. This study introduces an innovative joint design methodology, focusing on examining the seismic responsiveness of the uniquely designed SRC columns ...

Download Citation | Shape-Memory Electrochemical Energy Storage Devices | With the great development of rechargeable energy storage devices, security, operation, product life and quality of ...

Compared with sensible heat energy storage and thermochemical energy storage, phase change energy storage has more advantages in practical applications: ... size must be designed for specific use cases. You et al. [16] adopted a topology optimization method to design the fin shape in the phase change heat storage unit. Under arbitrary boundary ...

This paper addresses the challenging task of determining the position and posture of small-scale thin metal parts with multi-objective overlapping. To tackle this problem, we propose a method that utilizes instance segmentation and a three-dimensional (3D) point cloud for recognizing the posture of thin special-shaped metal parts. We investigate the process of ...

Renewable energy is a prominent area of research within the energy sector, and the storage of renewable energy represents an efficient method for its utilization. There are various energy storage methods available, among which compressed air energy storage stands out due to its large capacity and cost-effective working medium. While land-based compressed ...

The same mass m can now be distributed in a ring, Fig. 11.2B without changing the velocity of the mass or the energy stored. By knowing the moment of inertia for such a geometry; I = mr2, the energy stored can be expressed as: (11.2) E = 1 2 I o 2 Now if the same mass m has the shape of a thin disc of outer radius r, Fig. 11.2C, then the moment of inertia ...

Long-duration energy storage (LDES) technologies will fulfill the need to firm variable renewable energy resource output throughout the year. Conventional electrochemical batteries (e.g., lithium-ion) are uneconomical in this role due to high energy capacity costs. Thermal energy storage (TES) is one promising technology for LDES applications ...

Li-S batteries should be one of the most promising next-generation electrochemical energy storage devices because they have a high specific capacity of 1672 mAh g -1 and an energy density of ...

Solar energy is known as the most ideal energy because of its huge content (the energy radiated by the sun to the earth per second is equivalent to the heat released by burning 5 × 10 16 tons of standard coal), wide distribution (the number of sunshine hours in most parts of China exceeds 2000 h per year), clean use and short construction period [1], [2].

This study focuses on the renovation and construction of compressed air energy storage chambers within abandoned coal mine roadways. The transient mechanical responses of underground gas storage chambers under a cycle are analyzed through thermal-solid coupling simulations. These simulations highlight changes in key parameters such as displacement, ...

Screw compressors are highly researched and developed prospects in industry because of their long service life, high transmission efficiency, low footprint and low vibration. As the key core part of the screw compressor, the screw is a typical, long-shaft, complex profile part. Its processing method, manufacturing accuracy and quality have an extremely important ...

This work presents a method to produce structural composites capable of energy storage. They are produced by integrating thin sandwich structures of CNT fiber veils ...

To meet the growing need for high-performance energy storage devices, new, more efficient component designs and chemistries are needed. Traditional thin-film designs require a large footprint or standard shapes (e.g., cylinder, cuboid, etc.) to provide sufficient energy storage, which is challenging for portable applications that have size or weight limitations.

The optimized SS-FPC based on p-type material-doped CNTY, which integrates the high specific capacitance of the solid-state fiber-shaped electrochemical energy storage ...

Special-shaped energetic grains can realize special functions and needs due to their special shape [], complex structure, and partial or full height symmetry, which makes their demand in the fields of weaponry and aerospace more urgent [].For example, in the field of weaponry, propellant is used as the energy source for barrel weapons to launch projectiles, ...

This work looks into the recent advances in quasi-solid-state fiber-shaped aqueous ESDs, by providing a comprehensive and critical overview of new design principles, key progress in both materials and devices, and system integrations. The currently on-going surge in portable and wearable electronics and devices has caused an ever-increasing rise in the ...

A shearer drum with low-energy-consumption special-shaped picks, including a drum hub, an end plate is

fixed at one end of the drum hub close to the free surface of the non-coal wall, a plurality of spiral blades of the same rotation are arranged on the drum hub, and one end of the spiral blade It is connected with the end plate, and the other end forms a free end.

Carbon-based material, conductive polymer (PPy, PANI, PEDOT, etc.) and other one-dimensional (1D)-structured metallic wires, cotton thread, and yarn produced by spinning are the widely used substrates for fiber-type energy storage devices.

Large-scale energy storage is so-named to distinguish it from small-scale energy storage (e.g., batteries, capacitors, and small energy tanks). The advantages of large-scale energy storage are its capacity to accommodate many energy carriers, its high security over decades of service time, and its acceptable construction and economic management.

The above results demonstrate that CNTY-P can be simultaneously used for energy conversion and electrochemical energy storage. Therefore, the self-powered and flexible integrated solid-state fiber-shaped photo capacitor (SS-FPC), including the energy conversion unit and energy storage unit, were integrated, as shown in Fig. 6 (a). As mentioned ...

This paper will provide a detailed review on the importance of substrates in electronic devices, intrinsic property requirements, fabrication classification and applications in ...

To fulfill flexible energy-storage devices, much effort has been devoted to the design of structures and materials with mechanical characteristics. This review attempts to critically review the state of the art with respect to materials of electrodes and electrolyte, the device structure, and the corresponding fabrication techniques as well as ...

Effect of Y-shaped fins on the performance of shell-and-tube thermal energy storage unit. ... investigated the thermal response of a shell-and-tube energy storage system made up of parts with .

In this study, a new type of shaped energy storage phosphorus building aggregate was developed, and the feasibility of its application in ES-LAC was evaluated from the micro- and macro-performance perspectives. However, the study did not consider the actual model of temperature when determining the energy saving effect of ES-LAC for board and ...