Solid state battery patent

What is a solid state battery?

In contrast to conventional lithium-ion batteries, which use liquid electrolytes, solid-state batteries use a solid electrolyte material to help ions travel between electrodes. Solid-state batteries naturally offer faster charging due to their superior ion conductivity compared to liquid electrolytes [194, 195, 196].

Are solid-state batteries the future of energy storage?

The development of solid-state batteries in energy storage technology is a paradigm-shifting developmentthat has the potential to enhance how batteries are charged and used.

Are solid-state batteries safe?

Additionally,it may raise the danger of oxidation and thermal runaway. Solid-state batteries must have reliable and effective sealing mechanisms to stop moisture and air from entering the battery compartment. The stability of the battery can be improved by using solid electrolyte materials that are less vulnerable to moisture and air exposure.

Are solid-state batteries better than Li-ion batteries?

Although Li-ion battery technology has been investigated for many years,a major breakthrough,the invention of solid-state batteries,has only recently arrived. It offers better safety,higher energy density,and improved cycle life.

What are the challenges of solid-state batteries?

However,solid-state batteries possess some challenges,mainly high cost,mechanical and interfacial instability,and dendrite formation,as shown in Fig. 3. In recent years,significant progress has been made in developing SSBs,and researchers worldwide are working to overcome the remaining challenges and bring this technology to market [7,8].

What is pressure-assisted solid-state battery fabrication?

Pressure-assisted solid-state battery fabrication is a promising technique that enhances interface stability by maintaining continuous contact between the solid electrolyte and electrode materials [31, 172, 173]. b.

Hyundai is pursuing a major step forward in solid-state battery technology with a newly published patent application in the United States. The patent covers a method allowing ...

Bruce Dunn "The work by [the University of Maryland research team] effectively solves the lithium metal-solid electrolyte interface resistance problem, which has been a major barrier to the development of a ...

This report provides essential insights into recent patent application trends and highlights the notable innovations shaping the next generation of battery technologies.

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As one of such solid-state batteries, a fully solid-state battery is described in Japanese Patent Application Publication No. 06-275274 (JP-A-06-275247) in which the power generation...

An inorganic solid-state electrolyte is a solid material suitable for electrically isolating the positive and negative electrodes of a lithium secondary battery while also providing a...

The present invention is a solid-state battery formed of a plurality of repeatedly stacked solid-state battery cells each including a positive electrode layer, a negative electrode ...

This study systematically analyzes patents to categorize innovations addressing key challenges in SSB design and manufacturing, focusing on performance, safety, ...

Finally, this paper gives the direction of improvements to the challenges threatening solid-state battery commercialization. This comprehensive review study offers ...

Q2 2025 marked a significant period for solid-state battery technology, with over 1,510 new patent applications published. Leading patent applicants included industry giants ...

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