

# Patent protection for underwater energy storage system

underwater energy storage system is sometimes abbreviated as "UW-ES system". [0004] An underwater energy storage system for storing energy beneath the surface of a waterbody is for example known from Fig. 1A of WO20 15053615A1. [0005] It is further noted that CA2467287A1 discloses a power take-off and storage system according to the

The basic concept of this storage technology is also described in the patent DE 102011013329 A1. ... in combination with the installation of appropriate energy storage systems like the ... Wei Xiong, Zuwen Wang, Design and thermodynamic analysis of a multi-level underwater compressed air energy storage system. J. Energy Storage, 5 (2016), pp ...

There is described an energy storage system (300, 310) for storing energy in connection with a renewable energy generating facility (100). The energy storage system (300, 310) is operable to employ one or more of: (a) compressed air energy storage apparatus (300, 310) for storing energy generated by the energy generating facility (100), the stored energy ...

Electrolysers for hydrogen production. The 1.5°C Pathway report issued by the International Renewable Energy Agency (IRENA) predicts that hydrogen and derivatives will need to account for 12% of final energy use by ...

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Compressed Air Energy Storage (CAES) is an attractive energy storage technology that overcomes many drawbacks of known energy storage technologies. The ...

The invention provides an underwater energy storage system (UW-ES system) comprising a reservoir structure ( 5 ), which is resting at the bottom ( 4 ) of a waterbody ( 1 ), such as a se

An underwater energy storage system includes a tank for storing a compressed gas that is adapted to be stored underwater. The tank includes at least one water opening through which water from surrounding environment can flow into and out of the tank, and at least one gas opening through which the compressed gas is received. The underwater energy storage ...

The invention provides an underwater energy storage system (UW-ES system) comprising a reservoir

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structure (5), which is resting at the bottom (4) of a waterbody (1), such as a sea, an ...

A compressed fluid energy storage system includes a submersible fluid containment subsystem charged with a compressed working fluid and submerged and ballasted in a body of water, with the fluid containment subsystem having a substantially flat portion closing a domed portion. The system also includes a compressor and an expander disposed to ...

The invention relates to an underwater energy storage system (1) for an off-shore wind turbine (19), the underwater energy storage system (1) comprising a hollow shaft (6), a generator (13), a motor (2) and a mass (3) attached to the motor (2). The invention further relates to a wind farm (30) comprising the underwater energy storage system (1), whereby the wind farm (30) further ...

Abstract: Underwater compressed air energy storage (UCAES) uses the hydrostatic pressure of water to realize isobaric storage of the compressed air. The advantages of such a method include high efficiency, reduced topographical limitations, and flexibility in storage scale, providing a potentially suitable technology for storing offshore renewable energy.

The invention relates to an underwater energy storage system (1) for an off-shore wind turbine (19), the underwater energy storage system (1) comprising a hollow shaft (6), a ...

European Patent Office Prior art keywords container water energy storage storage system void Prior art date 2018-03-23 Legal status (The legal status is an assumption and is not a legal conclusion. Google has not performed a legal analysis and makes no representation as to the accuracy of the status listed.) Active Application number EP19716597.0A

WO2019117711A1 - Underwater energy storage system - Google Patents Underwater energy storage system Download PDF Info Publication number ... 2018-12-10 Priority to CN201880079627.7A priority Critical patent/CN111566339B/zh 2018-12-10 Priority to PL18839926T priority patent/PL3724491T3/pl

Compressed air energy storage is a way to store energy generated during periods of low energy demand for use during periods of high energy demands. It has been proposed to ...

European Patent Office Prior art keywords reservoir energy storage system working liquid waterbody Prior art date 2017-12-11 Legal status (The legal status is an assumption and is not a legal conclusion. Google has not performed a legal analysis and makes no representation as to the accuracy of the status listed.) Granted Application number ...

The apparatus comprises a flexible, non-permeable first sheet configured to cover at least a portion of the underwater structure, wherein the first sheet is further configured to be retained ...

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( 10 ) Patent No .: US 11,136,963 B2 ( 45 ) Date of Patent : Oct. 5, 2021 ( 54 ) UNDERWATER ENERGY STORAGE SYSTEM ( 58 ) Field of Classification Search CPC FO3D 9/17 ; HO2K 7/1823 ; FO3B 13/06 ; FO3B 13/1885 ; F05B 2260/22 ; F05B 2240/95 ; F05B 2240/97 See application file for complete search history .

The invention provides an underwater energy storage system (UW-ES system) comprising a reservoir structure (5), which is resting at the bottom (4) of a waterbody (1), such as a sea, an ocean, a waterway, etc. The reservoir structure has a pressurizing reservoir (7A, 7B) with a deformable wall structure (17A, 17B) and a depressurizing reservoir (8A, 8B) with a rigid wall ...

An energy storage system converts variable renewable electricity (VRE) to continuous heat at over 1000°C. Intermittent electrical energy heats a solid medium. Heat from the solid medium is delivered continuously on demand. An array of bricks incorporating internal radiation cavities is directly heated by thermal radiation. The cavities facilitate rapid, uniform heating via reradiation.

US10514021B2 - Underwater energy storage and electricity - Google Patents Underwater energy storage and electricity Download PDF Info Publication number US10514021B2. US10514021B2 ... 2019-05-11 Priority to US16/409,793 priority Critical patent/US10514021B2/en

Search specific patents by importing a CSV or list of patent publication or application numbers. The invention provides an underwater energy storage system (UW-ES system) comprising a...

storage system tank water energy storage power take Prior art date 2017-12-11 Legal status (The legal status is an assumption and is not a legal conclusion. Google has not performed a legal analysis and makes no representation as to the accuracy of the status listed.) Active Application number JP2020531592A Other languages Japanese (ja) Other ...

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, ...

More specifically it relates to a an underwater energy storage system comprising a container where energy is stored by transporting water between the container and a body of water, where...

energy power take storage system pressurizing Prior art date 2017-12-11 Legal status (The legal status is an assumption and is not a legal conclusion. Google has not performed a legal analysis and makes no representation as to the accuracy of the status listed.) Active Application number US16/770,870 Other languages English (en) Other versions

WO2019117711A1 - Underwater energy storage system - Google Patents Underwater energy storage system Download PDF Info Publication number ... 2018-12-10 Priority to KR1020207018717A priority Critical

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patent/KR20200093623A/ko 2018-12-10 Priority to US16/770,870 priority patent/US11136963B2/en

An energy storage system includes a module housing and multiple battery cells with insulating material and discharge directing material positioned inside the module housing. Each of the battery cells has a first end and a second end. ... 2019-06-27 Priority to US16/454,277 priority Critical patent/US11217862B2/en

Electrical energy storage (EES) alternatives for storing energy in a grid scale are typically batteries and pumped-hydro storage (PHS). Batteries benefit from ever-decreasing capital costs [14] and will probably offer an affordable solution for storing energy for daily energy variations or provide ancillary services [15], [16], [17], [18]. However, the storage capability of ...

US20140334884A1 US14/446,400 US201414446400A US2014334884A1 US 20140334884 A1  
US20140334884 A1 US 20140334884A1 US 201414446400 A US201414446400 A US 201414446400A US  
2014334884 A

Disclosed herein are embodiments of an electrical energy storage unit, a control system, and applications thereof. In an embodiment, the electrical energy storage unit (which may also be referred to as a battery energy storage system ("BESS")) includes a battery system controller and a plurality of battery packs. Each battery pack of the plurality of battery packs has a plurality of ...

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