ShwayComs cg-s4 : Kenta - pneumatic battery / capacitor for variable source energy platforms

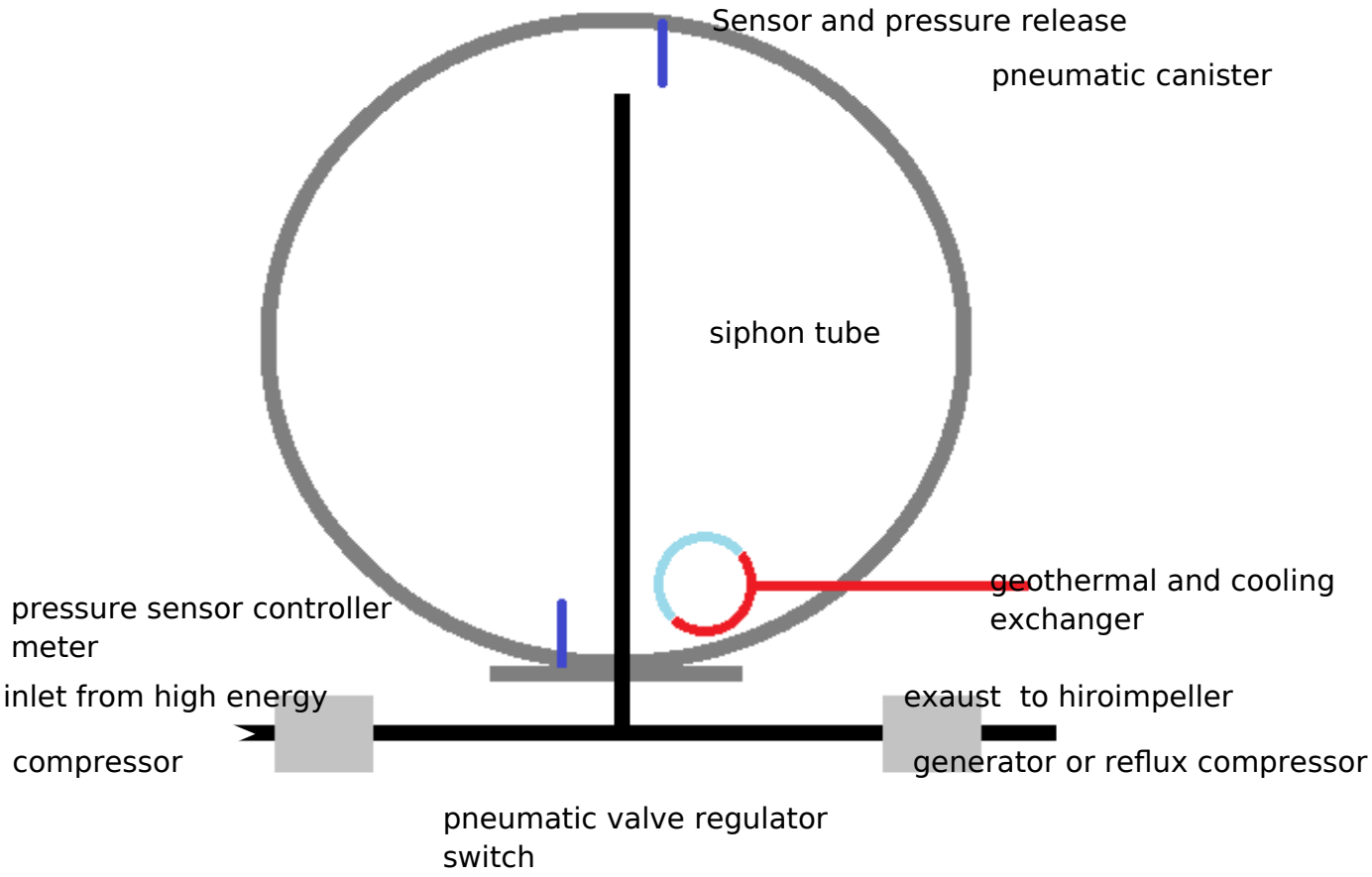
Brief : Kenta SE PRV : :

This document is a patent application by and covers a overview of ShwayComs pneumatic capacitor / battery is a energy conservation and storage technology improvement innovation 2019-03-06. A Kenta is deployed as active capacitance energy storage by design and concept for variable source energy as with wind turbine and solar panels as well as providing a utility for peak energy demand management. Proposal of Kenta is a development solution put forward with this patent document here in example coal fired energy generation, incinerator power generation and industry processing plants as with cement manufacture. A pneumatic battery proposes a low maintenance solution with little corrosion collateral exposure housed units with reduced part count compared with conventional generator solutions with consumables. Utility providers can use this concept in remote from source renewable energy outlets such as for example electric vehicle fast charge stations for automotive that place a high energy demand of infrastructure current throughput not available in many areas with pressure storage tanks and pneumatic generators. Thermal loop at pneumatic feed and active cooling at pneumatic release points pose greatest challenge of energy loss for variable energy input from solar or wind to a Kenta leveraged energy utility grid or micro-grid. Scaled to potential pneumatic compression technology from pneumatic battery can solve many of the short comings of variable source energy wind and solar; a battery is used to regulate variable source energy delivery for improved consistency a reservoir of on demand energy for cloudy / summer rain functioning as backup unit for energy and storage power supply unit as typically functioned by a chemical batteries in current energy farms.

This document should be reviewed by a electrician and engineer for interpolation and assessment.

Kenta is a utility pneumatic storage battery for intermittent renewable sourced energy, solar, wind turbine grid renewable load balancing and is a suitable design for high capacity storage working environments as with a solar farm allowing a utility provider to store energy during the day for release at night or at requirement pattern demand as is a character of variable energy sources requiring load balancing.

4.2 utility storage Kenta battery



Controlled pneumatic valve switching from inlet to exhaust via the units siphon tube at two points could as well be achieved with a switched flow valve for one nozzle with dual purpose bi-directional with efficiency points. This unit has a pressure / proximity sensor controller meter that functions cutoff switching to the units compressor ensuring cutoff should a units canister fill to maximum capacity protecting this utility from overflow and empty operation.

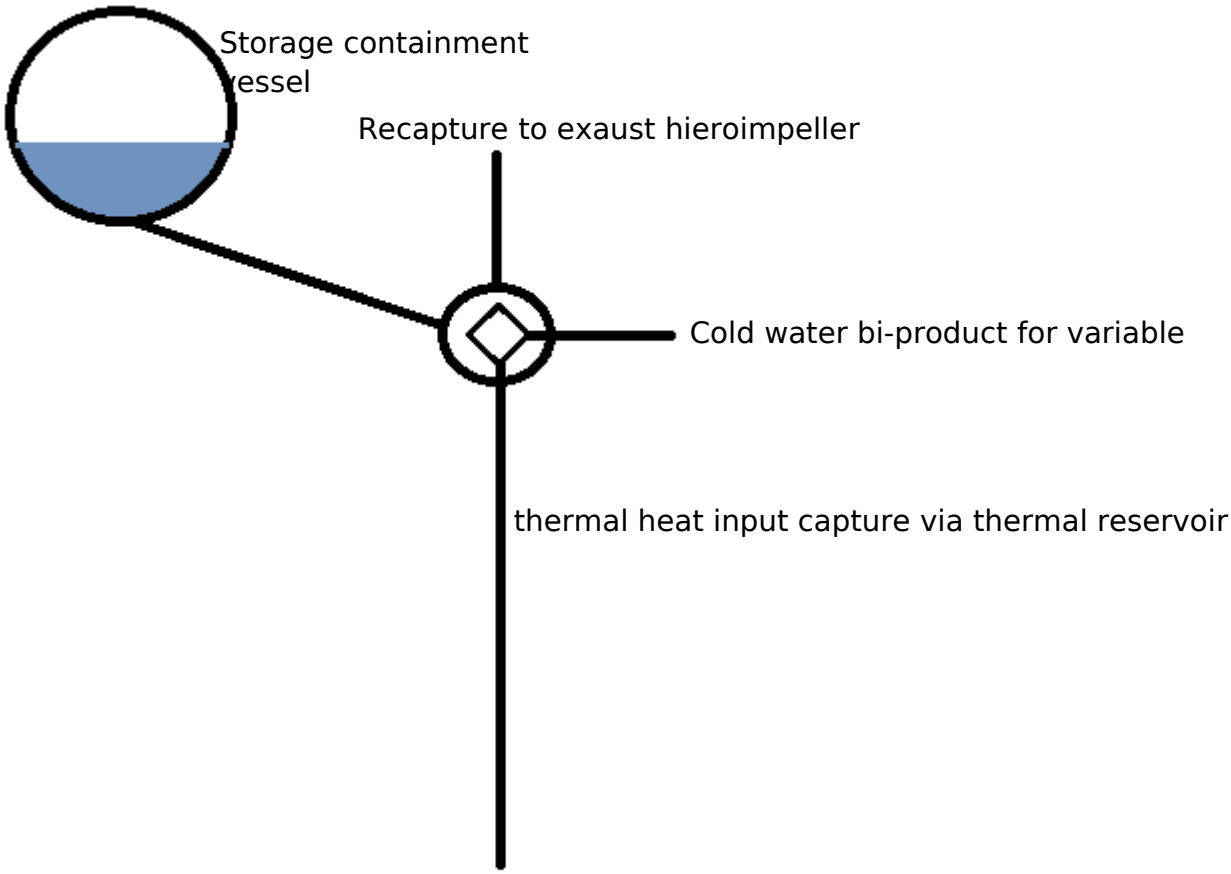
Hydroxide with suitable crushed rock like calcium can be added to a river water Kenta for augmented active sequestering of aggressive trace elements over time such as acid compounds co2, nitric oxides from combustion and partial combustion capturing pollutants improving air quality in increment with even up to an approximate century equivalent of natural weathering in a 24 hour cycle for environmental control .

A waste heat thermal feeder load energy element is used to maintain an optimal feed temperature on regeneration and active gadolinium cooling of Kenta feed when required during sequestering and storage to realize feed temperatures below ambient.

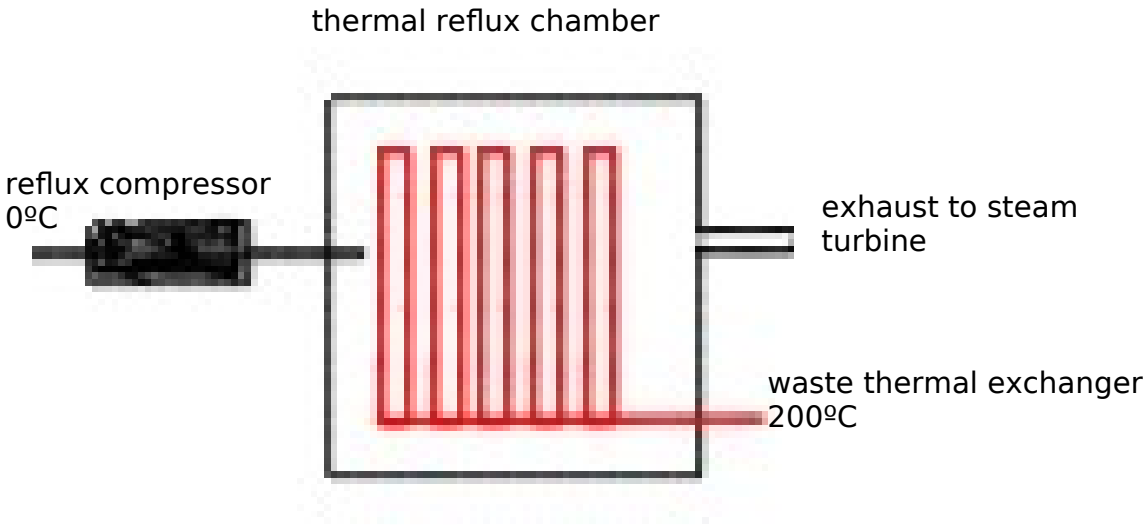
During the storage phase; waste heat is stored for use while reflux generating; heat in storage thermal reservoir can also be complimented with available energetic cooling energy input from solar capture. Active cooling here using a gadolinium effect is applied to the Kenta during storage which is an input of energy to the platform; these usages while consuming energy in themselves increase the systems global storage capacity while raising efficiency. At generation cycles phase transitioning of hydrolysis proves to play an important mechanical role in the active transport capture of waste compounds like Co2 and Nox where multiple phase transitions play an important role while maintaining temperature cycles above and below negative celsius temperatures for hydrolysis and chemical capture while maintaining operating pressure for reflux compressor injection to a reflux chamber. As with for example the process of a stirling engine generator there is a balance achievable of pressure potential generation and temperatures potential differential on reflux generation. Geothermal temperature control interacts with a reflux compressor for an optimal discharge balance of temperature and pressure.

Net thermal dissipation with thermal storage gain recapture module

At point of regeneration discharge, a large scale Kenta of plant variation employs a thermal reservoir for storage energy input to where more energy is realized than solar energy input from this units compressor complimented by thermal reservoir for net negative quota thermal plant value.


Storage containment
vessel
Recapture to exaust hieroimpeller
Cold water bi-product for variable
thermal heat input capture via thermal reservoir

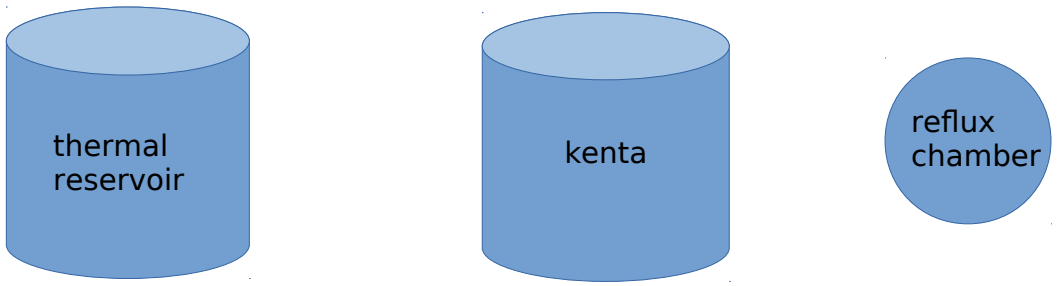
With Kenta 4.3 a thermal reservoir serves to capture, store and circulate thermal energy at a temperature stored in mineral oil medium at approximate 200ºC which is then released to the Kenta battery by heating element on generation reflux. The thermal reservoir input is an isolated from storage liquefied exhaust tank and thermal reservoir tanks and adds energy into scaled fast feeder storage plants / cells for controlled generation and boil off.



With this module one has input of waste heat stored from a coal fired combustion exhaust which is recaptured energy typically at ~450°C giving this industrial scale variable energy storage solution a negative thermal value for environment advantage with waste material capture from coal or incinerator plant that is captured with hydrolysis of seawater negative ion capture having an alkali pH of ~8. Waste from combustion exhaust being captured by seawater is permanently sequestered at site to porous bedrock for example alkali basalt bedrock which reacts with combustion waste compounds including Co2 to form carbonate captured by hydrolysis requiring an interim sequester of two years relying on hydrolysis alone.

The largest coal fired / incinerator plants burn ~1200 tonnes of material hourly releasing ~3500 tonnes Co2 hourly with an estimated release of ~8,500 m3 volume of exhaust feed material hourly when stored to a Kenta battery. Should this plant l energy for twelve hours the plant produces ~115,000 m3 of exhaust gas when stored by a Kenta pneumatic battery in daily cycle. It is proposed that 140,000 m3 of seawater is required for hydrolysis capture of waste material. With these overview figures a Kenta volume of 250,000 m3 is required for operation with recapture of pollution waste at these coal operated plants and incinerator plants. A single spherical pneumatic Kenta with a diameter of 80 meters is sufficient for daily operation of this type of plant should one

employ a single Kenta at site; this and a thermal reservoir of the same size would comprise an installation of a Kenta battery for renewable load balancing. Since this coal fired example installation is for one of the worlds largest coal plants it is suggested to use several smaller tanks for example 8 Kentas of 40 meter diameter each. Harvest capture of waste energy is significant and sequester of pollution is significant with the 4.3 Kenta.



The slurry waste from operation some 140,000 m3 of waste can be pumped stored to deep porous strata bedrock for permanent sequester where we find elements in concentrate like calcium being one of the most abundant minerals of the earth; we can use river water hydrolysis transport where we have alkali strata such as porous alkali basalt which reacts with the waste to form for example carbonate compounds in the rock strata for on site sequester. With many layers of strata to choose from each having unique character we expect to find suitable strata at any plant site since transport of waste materials needs to be kept to a minimum given an olympic size pool of material is 2,500 m3 of material and we have a daily volume of ~115,000 m3 of waste to dispose of at the larger coal fired plants of the world. Where a pipeline is not warranted this volume of seawater would requisite a dedicated rail logistic with tanker rail dispatched ~8 minutes in interval maintained for ~6 hours to service this volume of seawater to and from the ocean for this size of coal fired power generation. Using Kenta 4.3 one can expect to sequester >70% of pollution waste and 100% of particulate pollution. Given that coal fired plants have a thermal conversion efficiency of ~40% there is ~3,500 MWe .. 4,500 MWe of waste energy to be recaptured daily at these larger installations which solves for financing of waste disposal with sequester.

Claims:

This type of energy storage for renewable variable storage and load balancing including proposed modes of employ does not exist; I am the fabricator of design and proposal concepts put forward here in suit of recognition and seeking to make this available for use in energy mix for variable sourced energy currently limited to chemical battery storage. This technology is warranted and necessary for the transition period from centralized energy to a decentralized renewable energy mix. Presented here is usage covering an introduction of application as well as elaborated proposal of use in energy transfer methodology. A pneumatic capacitor / battery called a "Kenta" with pneumatic generator reduces the users energy footprint for energy storage device with variable renewable energy sources scalable to utility solutions. Employing a Kenta is a solution making it possible to move variable source energy zones off grid using pneumatic battery / capacitor technology dramatically reducing capacity investment in source variable energy by improving managed delivery efficacy with demand response. Kentas can be used for base load pattern necessary grid and infrastructure capacity with downtime allowing functionality service in variable source energy solutions where previously a greater capital investment in source would have been necessary. Functioning as a pneumatic battery / capacitor supports low loss retention rating of energy storage potential. Pneumatic batteries can integrate in security systems for critical mission operations for example data center backup and short time frame emergency backup. Pneumatic batteries / capacitors can be in large utility networked plant design with for example a dozen large units at any capacity tanks with up to a million m3 capacity unlimited. Pneumatic batteries / reactors can also be in a grid network in tandem operation for solar farms close to created demand reducing grid workload as a base load balancing solution. Ocean disposal of Co2 can have a benefit of seeding nutrient for algea bloom encouragement plant nutrient encouragement while providing food chain enrichment for marine biodiversity and waste can be treated for sulfur, Nox compounds prior to discharge. Discharge to shelf presents a paradigm alternative to discharge further out to sea along with waste water treatment possibilities for case specific marine discharge.