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(54) Title: A SYSTEM FOR STORING AND TRANSFERRING HEAT, COMPRISING A SOLID BULK MATERIAL

(57) Abstract: The present invention relates to a heat storage and transfer system, comprising at least one heat source for generating thermal energy; a high-temperature heat storage system comprising a bulk refractory material (1) filling a high-temperature storage space (14) for storing the generated thermal energy; at least one heat consumption system for consuming the stored thermal energy; and a heat transfer mechanism for transferring heat from the heat source to the high-temperature heat storage system and from the high-temperature heat storage system to the heat consumption system. The heat transfer mechanism is a closed gas circuit connecting the heat source, the high-temperature heat storage and the heat consumption system. The high-temperature heat storage system is partially encased by a load-bearing inner shell (3). The bulk refractory material (1) comprises a particle fraction with a sphericity range of 0.4 to 1 and a medium particle size range of 0.5 to 20 mm. The ratio of the volume of the largest to the smallest particles is at most 5:1. The load-bearing inner shell (3) is enclosed with a thermal-insulating outer shell (5) such that a gas gap (4.1) is provided between the load-bearing inner shell (3) and the thermal-insulating outer shell (5) to recover heat loss from the high-temperature heat storage penetrating the load-bearing inner shell (3). The gas gap (4.1), together with an interconnecting gas channel (4.3), connects the high-temperature heat storage to at least one technological area (4.2), which is further connected to at least one heat consumption system. A hot gas channel (7) connects the high-temperature heat storage system to at least one heat source. The invention also relates to a method of storing and transferring heat using said system.

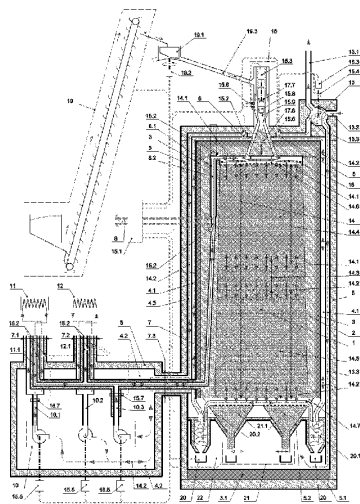


Fig. 1

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