CLAIMS

1. A method of reversibly storing and/or extracting energy comprising the steps of:

-heating an inner region of a sensible heat storage body using a removable heating element thereby storing energy, wherein a portion of the heating element is in contact with the inner region of the sensible heat storage body;

-extracting energy by flowing a heat transfer medium having a temperature below that of said sensible heat storage body such that energy is transferred from the sensible heat storage body to the heat transfer medium,

thereby providing reversible energy storage and extraction.

2. A method according to claim 1, wherein a heating portion of the heating element is in contact with the inner region of the sensible heat storage body.

3. A method according to claim 1 or 2, wherein the sensible heat storage body is enclosed in an enclosure.

4. A method according to claim 3, wherein the heating element is sealingly engaged with the enclosure.

5. A method according to any one of claims 1 to 4, wherein the heating element is an electrical resistor.

6. A method according to any one of claims 1 to 5, wherein the heating element comprises at least one tubular loop of electrically resistive material to heat the inner region of the sensible heat storage body.

7. A method according to any one of claims 1 to 6, wherein the inner region of the sensible heat storage body is heated by a plurality of heating elements.

8. A method according to any one of claims 3 to 7, wherein the enclosure comprises a gas inlet to substantially fill the enclosure with an inert gas and a gas outlet to vent inert gas.

9. An energy storage apparatus comprising:

-a sensible heat storage body having a heat exchanger channel and a heating element channel adapted to receive a removable heating element, wherein the heating element channel is located internally of the sensible heat storage body; and

-a heat exchanger having an inlet and an outlet, wherein at least a portion of the heat exchanger is disposed along the channel.

10. An energy storage apparatus according to claim 9, wherein the sensible heat storage body comprises a heat exchanger channel having at least two open ends within the sensible heat storage body.

11. An energy storage apparatus according to claim 9 or 10, wherein the sensible heat storage body is assembled by component parts.

12. An energy storage apparatus according to any one of claims 9 to 11, wherein the heat exchanger is in the shape of a serpentine coil or a helical coil.

13. An energy storage apparatus according to any one of claims 9 to 12, further comprising a heating element comprising:

-an elongated heating portion at one end;

-a thermally insulated portion at an opposite end;

-wherein the thermally insulated portion further comprises an electrical conductor adapted to be in electrical communication with an electrical terminal; and
wherein the elongated heating portion comprises at least one tubular loop.

14. An energy storage apparatus according to any one of claims 9 to 13, wherein the energy storage apparatus further comprises insulation.

15. An energy storage apparatus according to any one of claims 9 to 14, wherein the energy storage apparatus further comprises an enclosure.

16. An energy storage apparatus according to claim 15, wherein the enclosure comprises at least one aperture adapted to receive a heating element and/or a heat exchanger.

17. An energy storage apparatus according to claim 16, wherein the at least one aperture further comprises a sealing flange.

18. An energy storage apparatus according to claim 16 or 17, further comprising a sealing gasket.

19. An energy storage apparatus according to claim 17 or 18, wherein the heating element is sealingly engaged with the sealing flange.

20. An energy storage apparatus according to claim 17 or 18, wherein the heat exchanger is sealingly engaged with the sealing flange.

21. An energy storage array comprising: a plurality of energy storage apparatus according to any one of claims 9 to 20.

22. An energy storage array according to claim 21, wherein the energy storage apparatus according to any one of claims 9 to 20 are in thermal and/or electrical communication.