Claims

1. a cooling container, comprising:

a thermally insulating container comprising a storage space;

an aperture on the thermally insulating container through which the storage space is exposed to the outside of the cooling container;

a top structure mountable on the aperture to block the aperture and configured to be thermally insulating;

wherein the top structure comprises a radiative cooling portion comprising an internal surface and an external surface,

wherein the internal surface faces the storage space and the external surface is exposed to an outside of the thermally insulating container when the top structure is mounted on the aperture, and

wherein the radiative cooling portion is configured to dissipate heat from the storage space by emitting a thermal radiation to the outside via the external surface.

2. the cooling container of claim 1,

wherein the top structure further comprises a thermal storage medium arranged to be in thermal contact with the internal surface and with the storage space such that heat is dissipated from the storage space and the thermal storage medium by the radiative cooling portion.

3. the cooling container of claim 2,

wherein the thermal storage medium comprises a sensible heat storage material.

4. The cooling container of claim 2,

wherein the thermal storage medium comprises a latent heat storage material.

5. the cooling container of any preceding claim,

wherein the top structure further comprises a heat siphon structure configured to facilitate a circulation of air inside the storage space when the radiative cooling portion is colder than the storage space.

6. the cooling container of any preceding claim, further comprising:

a heat mirror structure configured to be mountable on the top structure and to reflect and redirect the thermal radiation from the radiative cooling portion within a predetermined solid angle from a normal direction from the external surface.

7. the cooling container of claim 6,

wherein the heat mirror structure comprises a first opening and a second opening, and

wherein the heat mirror structure is arranged such that the thermal radiation emitted from the external surface enters the heat mirror structure through the first opening and exits through the second opening.

8. the cooling container of any preceding claim 7,

wherein the heat mirror structure comprises a convective cover disposed over the the second opening and configured to transmit the thermal radiation and to shield the radiative cooling portion from an air flow of the outside of the cooling container.

9. the cooling container of any one of claims 6 to 8,

wherein the heat mirror structure comprises a grid structure such that a plurality of channels are formed from the first opening and the second opening, and

wherein each of the plurality of channels is configured to reflect and redirect the thermal radiation emitted from the external surface.

10. the cooling container of any preceding claim, further comprising:

a cap mountable on the thermally insulating container,

wherein the cap is configured to be thermally insulating such that the storage space is thermally insulated when the cap is mounted, and

wherein when the cap is disposed over the radiative cooling portion, the cap is configured to block the thermal radiation emitted from the radiative cooling portion.

11. a structure for covering an aperture of a container, comprising:

a radiative cooling portion comprising an internal surface and an external surface;

a thermally insulating portion configured to house the radiative cooling portion and to be fitted into the aperture,

wherein when the structure is disposed on the container to cover the aperture, the internal surface faces a storage space of the container and the external surface is exposed to an outside of the container, and

wherein the radiative cooling portion is configured to dissipate heat from the storage space by emitting a thermal radiation to the outside via the external surface.

12. the structure of claim 11,

a thermal storage medium arranged to be in thermal contact with the internal surface and such that when the structure is disposed on the container to cover the aperture, the thermal storage medium is in thermal contact with the storage space and such that heat is dissipated from the storage space and the thermal storage medium by the radiative cooling portion.

13. the structure of claim 11 or 12, further comprising:

a heat siphon structure configured to facilitate a circulation of air inside the storage space when the radiative cooling portion is colder than the storage space.

14. the structure of any one of claims 11 to 13, further comprising:

a heat mirror structure configured to reflect and redirect the thermal radiation from the radiative cooling portion within a predetermined solid angle from a normal direction from the external surface.

15. the structure of claim 14,

wherein the heat mirror structure comprises a first opening and a second opening, and

wherein the heat mirror structure is arranged such that the thermal radiation emitted from the external surface enters the heat mirror structure through the first opening and exits through the second opening.

16. the structure of any one of claim 15,

wherein the heat mirror structure comprises a convective cover disposed over the second opening and configured to transmit the thermal radiation and to shield the radiative cooling portion from an air flow of the outside of the cooling container.

17. the structure of any one of claims 14 to 16,

wherein the heat mirror structure comprises a grid structure such that a plurality of channels are formed from the first opening and the second opening, and

wherein each of the plurality of channels is configured to reflect and redirect the thermal radiation emitted from the external surface.