CLAIMS

1. A portable container including an integral controlled evaporative cooling system, comprising:

an internal storage container wall sealed to an internal storage container bottom, the internal storage container wall and the internal storage container bottom positioned to form a storage container with an access aperture;

an external storage container wall sealed to an external storage container bottom, the external storage container wall positioned adjacent to the internal storage container wall and the external storage container bottom positioned adjacent to the internal storage container bottom, an edge of the exterior storage container wall sealed to the internal storage container wall to form a vapor-sealed evaporative region between the external storage container wall and the external storage container bottom and the internal storage container wall and the internal storage container bottom;

a first insulation wall sealed to a first insulation bottom of a size and shape to be positioned adjacent to an exterior surface of the external storage container wall and the external storage container bottom;

a second insulation wall sealed to a second insulation bottom of a size and shape to be positioned adjacent to the first insulation wall, the second insulation wall sealed to the first insulation wall to form an insulation region between the first and second insulation walls and the first and second insulation bottoms;

a desiccant region wall sealed to a desiccant region bottom of a size and shape to be positioned adjacent to an exterior surface of the second insulation wall and the second insulation bottom to form an exterior surface of the portable container, the desiccant region wall sealed to the exterior surface of the second insulation wall to form a vapor-sealed desiccant region;

a vapor conduit with a first end positioned within the vapor-sealed evaporative region, and a second end positioned within the vapor-sealed desiccant region; and

a vapor control unit attached to the vapor conduit, wherein the vapor control unit includes a valve of a size, shape and position to reversibly inhibit flow of gas through the vapor conduit.

2. The portable container of claim 1, wherein the storage container with the access aperture comprises:

a single access aperture at the top of the storage container.

3. The portable container of claim 1, wherein the storage container with the access aperture is cylindrical with an open top region forming the access aperture.

4. The portable container of claim 1, wherein the storage container with the access aperture includes rounded edges with an open top region forming the access aperture.

5. The portable container of claim 1, wherein the storage container with the access aperture includes internal structures in a radial configuration.

6. The portable container of claim 1, wherein the vapor-sealed evaporative region comprises:

an evaporative liquid;

a wick structure for the evaporative liquid; and

a gas pressure less than the ambient gas pressure.

7. The portable container of claim 1, wherein the vapor-sealed evaporative region comprises:

a vapor-sealed junction around a region of the vapor conduit, the vapor conduit traversing the wall of the vapor-sealed evaporative region or the bottom of the vapor-sealed evaporative region.

8. The portable container of claim 1, wherein the first insulation wall is formed as a cylindrical structure.

9. The portable container of claim 1, wherein the first insulation wall is formed as a structure with rounded edges.

10. The portable container of claim 1, wherein the external storage container wall and the external storage container bottom are positioned adjacent to an exterior of the first insulation wall and the first insulation bottom.

11. The portable container of claim 1, wherein the first insulation wall encircles an exterior surface of the external storage wall.

12. The portable container of claim 1, wherein the desiccant region wall encircles the exterior surface of the second insulation wall.

13. The portable container of claim 1, wherein the vapor-sealed desiccant region comprises:

desiccant material.

14. The portable container of claim 1, wherein the vapor-sealed desiccant region comprises:

a vapor-sealed junction around a region of the vapor conduit, the vapor conduit traversing the wall of the vapor-sealed desiccant region or the bottom of the vapor-sealed desiccant region.

15. The portable container of claim 1, wherein the vapor control unit comprises:

a controller operably attached to the valve.

16. The portable container of claim 1, wherein the vapor control unit comprises:

a thermostat, the valve operably attached to the thermostat.

17. The portable container of claim 1, wherein the portable container forms a cylindrical structure.

18. The portable container of claim 1, comprising:

a temperature sensor attached to the storage container.

19. The portable container of claim 1, further comprising:

a shutoff valve of a size, shape and position to reversibly fully inhibit flow of gas through the vapor conduit; and

a switch operably attached to the shutoff valve, the switch positioned to cause the shutoff valve to fully open and fully close in response to an external action on the switch.

20. The portable container of claim 1, further comprising:

a temperature sensor attached to the storage container;

a heating element positioned adjacent to one of the internal storage container wall, the external storage container wall, the internal storage container bottom, or the external storage container bottom; and

a controller connected to the temperature sensor, the vapor control unit, and the heating element.

21. The portable container of claim 1, further including an internal recharging system, comprising:

a temperature sensor affixed to the portable container;

a heating element positioned within or adjacent to the vapor-sealed desiccant region; and

a controller connected to the temperature sensor and the heating element.

22. The portable container of claim 1, further comprising:

a binary valve operably attached to the vapor conduit, wherein the binary valve is distinct from the valve of the vapor control unit; and

an externally-operable switch operably attached to the binary valve.

23. Components of a portable container including an integral controlled evaporative cooling system, comprising:

a storage container with an internal evaporative region, including;

an internal storage container wall sealed to an internal storage container bottom, the internal storage container wall and the internal storage container bottom positioned to form a storage container with an access aperture,

an external storage container wall sealed to an external storage container bottom, the external storage container wall positioned adjacent to the internal storage container wall and the external storage container bottom positioned adjacent to the internal storage container bottom, an edge of the exterior storage container wall sealed to the internal storage container wall to form an evaporative region between the external storage container wall and the external storage container bottom and the internal storage container wall and the internal storage container bottom,

a vapor conduit with a first end positioned within the vapor-sealed evaporative region, and a second end positioned adjacent to the external storage container wall in the exterior of the evaporative region, and

a vapor control unit attached to the first end of the vapor conduit, wherein the vapor control unit includes a valve of a size, shape and position to reversibly inhibit flow of gas through the vapor conduit; and

a desiccant container with an insulation region, including;

a first insulation wall sealed to a first insulation bottom of a size and shape to be positioned adjacent to an exterior surface of the storage container with minimal space between the containers,

a second insulation wall sealed to a second insulation bottom of a size and shape to be positioned adjacent to the first insulation wall, the second insulation wall sealed to the first insulation wall to form an insulation region between the first and second insulation walls and the first and second insulation bottoms,

a desiccant region wall sealed to a desiccant region bottom of a size and shape to be positioned adjacent to an exterior surface of the second insulation wall and the second

insulation bottom to form an exterior surface of the portable container, the desiccant region wall sealed to the exterior surface of the second insulation wall to form a desiccant region, and

an aperture in the desiccant container, the aperture of a size, shape and position to mate with the exterior of the second end of the vapor conduit.

24. The components of a portable container of claim 23, wherein the evaporative region comprises:

a wick structure for an evaporative liquid.

25. The components of a portable container of claim 23, wherein the first insulation wall is formed as a structure with rounded edges.

26. The components of a portable container of claim 23, wherein the external storage container wall and the external storage container bottom are positioned adjacent to an exterior of the first insulation wall and the first insulation bottom.

27. The components of a portable container of claim 23, wherein the insulation region comprises:

substantially evacuated space.

28. The components of a portable container of claim 23, wherein the desiccant region wall encircles the exterior surface of the second insulation wall.

29. The components of a portable container of claim 23, wherein the desiccant region includes:

desiccant material.

30. The components of a portable container of claim 23, wherein the vapor conduit comprises:

a hollow structure.

31. The components of a portable container of claim 23, wherein the vapor conduit comprises:

a tubular structure.

32. The components of a portable container of claim 23, wherein the vapor control unit comprises:

a thermostat, the valve operably attached to the thermostat.

33. The components of a portable container of claim 23, wherein the vapor control unit is attached to the first end of the vapor conduit.

34. The components of a portable container of claim 23, wherein the vapor

control unit is positioned centrally within the evaporative region.

35. The components of a portable container of claim 23, comprising:

a temperature sensor attached to the storage container; and

a controller operably attached to the valve of the vapor control unit.

36. The components of a portable container of claim 23, wherein the desiccant region, the evaporative region and the vapor conduit are of a size and shape to permit being sealed together with a continuous vapor-sealed interior region.

37. The components of a portable container of claim 36, wherein the continuous vapor-sealed interior region includes a gas pressure less than the ambient gas pressure adjacent to an exterior of the portable container.

38. The components of a portable container of claim 23, further comprising:

a lid of a size and shape to reversibly mate with an edge of the portable container adjacent to the access aperture.

39. The components of a portable container of claim 23, further comprising:

a temperature sensor attached to the storage container;

a heating element positioned adjacent to the internal storage container wall, the external storage container wall, the internal storage container bottom or the external storage container bottom; and

a controller connected to the temperature sensor, the vapor control unit, and the heating element.

40. The components of a portable container of claim 23, further including an internal recharging system, comprising:

a temperature sensor affixed to the portable container;

a heating element positioned within or adjacent to the vapor-sealed desiccant region; and

a controller connected to the temperature sensor and the heating element.

41. The components of a portable container of claim 23, further comprising:

a binary valve operably attached to the vapor conduit, wherein the binary valve is distinct from the valve of the vapor control unit; and

an externally-operable switch operably attached to the binary valve.

42. A method of manufacture of a portable container including an integral controlled evaporative cooling system, comprising:

positioning a storage container with an internal evaporative region, including;

an internal storage container wall sealed to an internal storage container bottom, the internal storage container wall and the internal storage container bottom positioned to form a storage container with an access aperture,

an external storage container wall sealed to an external storage container bottom, the external storage container wall positioned adjacent to the internal storage container wall and the external storage container bottom positioned adjacent to the internal storage container bottom, an edge of the exterior storage container wall sealed to the internal storage container wall to form an evaporative region between the external storage container wall and the external storage container bottom and the internal storage container wall and the internal storage container bottom,

a vapor conduit with a first end positioned within the evaporative region, and a second end positioned adjacent to the external storage container wall in the exterior of the evaporative region, and

a vapor control unit including a valve of a size, shape and position to reversibly inhibit flow of gas through the vapor conduit, wherein the vapor control unit is attached to the first end of the vapor conduit,

within a desiccant container with an insulation region, including;

a first insulation wall sealed to a first insulation bottom of a size and shape to be positioned adjacent to an exterior surface of the storage container with minimal space between the containers,

a second insulation wall sealed to a second insulation bottom of a size and shape to be positioned adjacent to the first insulation wall, the second insulation wall sealed to the first insulation wall to form an insulation region between the first and second insulation walls and the first and second insulation bottoms,

a desiccant region wall positioned adjacent to an exterior surface of the second insulation wall and sealed to the exterior surface of the second insulation wall to form a desiccant region, the desiccant region wall positioned to form an exterior surface of the portable container, and

an aperture in the desiccant container, the aperture of a size, shape and position to mate with the exterior of the second end of the vapor conduit;

sealing the second end of the vapor conduit to the aperture in the desiccant container with a gas- impermeable seal; and

evacuating the interior of a space within the container defined by the evaporative

region, an interior of the vapor conduit, and an interior of the desiccant region.