Claims

1. A cryogenic storage system, comprising:

an enclosure having a cavity;

a dewar that is positioned within the cavity of the enclosure, the dewar having:

a top portion;

a bottom portion that weights more than the top portion and is configured to stabilize the dewar in an upright position when the dewar is tilted, angled, or rotated within the enclosure regardless of an orientation of the enclosure;

an inner wall that forms a payload area that is configured to hold a liquid below an ambient temperature;

an outer wall, the outer wall and the inner wall having an opening that allows access to the liquid in the payload area;

a vapor plug that has a handle, a neck, the neck being inserted into the opening, and a locking device that locks the vapor plug in place and maintains a gap between the neck and the inner wall that allows gas to escape; and

an electronic thermocouple embedded within the neck of the removable vapor plug,

wherein the locking device includes one or more magnets embedded within an outer periphery of the neck, the one or more magnets embedded within the outer periphery of the neck interlocking with one or more other magnets within the inner wall of the dewar,

wherein the one or more magnets embedded within the outer periphery of the neck of the vapor plug and the one or more other magnets within the inner wall of the dewar are configured to maintain the gap between the neck of the vapor plug and the inner wall with the vapor plug in a first rotational position, and

wherein the one or more magnets embedded within the outer periphery of the neck of the vapor plug and the one or more other magnets within the inner wall of the dewar are configured to maintain the vapor plug in a location at least partially out of the dewar with the vapor plug in a second rotational position different from the first rotational position.

2. The cryogenic storage system of claim 1, wherein the dewar is shaped as a sphere and has a center of gravity or mass within the bottom portion of the dewar.

3. The cryogenic storage system of claim 1, wherein the enclosure is a cube, wherein the enclosure has a plurality of sides and a circular opening on each side of the plurality of sides to provide access to the dewar when the dewar is placed inside the cubicle enclosure.

4. The cryogenic storage system of claim 1, further comprising:

a corrugated neck tube that connects the inner wall and the outer wall and is configured to reduce an amount of heat conducted into the dewar, wherein the corrugated neck tube has a serpentine path to conduct the amount of heat.

5. The cryogenic storage system of claim 1, wherein the electronic thermocouple is configured to monitor temperature within the dewar.

6. The cryogenic storage system of claim 5, wherein the electronic thermocouple is configured to:

wirelessly connect with an electronic device; and

transmit a temperature within the dewar to the electronic device.

7. The cryogenic storage system of claim 1, further comprising:

a ball transfer device that is connected to and interfaces between the dewar and the enclosure, wherein the ball transfer device is configured to minimize friction between the dewar and the enclosure.

8. The cryogenic storage system of claim 1, wherein the dewar is a spherical dewar that rotates in three-dimensions.

9. The cryogenic storage system of claim 1, wherein the one or more magnets embedded within the outer periphery of the neck of the vapor plug and the one or more other magnets within the inner wall of the dewar have opposing polarities.

10. The cryogenic storage system of claim 1, wherein when the neck of the vapor plug is inserted into the opening, the locking device is configured to lock the vapor plug in place and is configured to prevent the vapor plug from falling out when the dewar is oriented or rotated in different directions.

11. A dewar for storing a liquid below an ambient temperature, comprising:

a top portion;

a bottom portion that weighs more than the top portion and is configured to stabilize the dewar in an upright position when the dewar is tilted, angled, or rotated within an enclosure regardless of an orientation of the enclosure;

an inner wall that forms a payload area configured to hold the liquid at the temperature below the ambient temperature;

an outer wall, the outer wall and the inner wall having an opening that allows access for the liquid in the payload area;

a vacuum port that is configured to produce a vacuum insulation between the inner wall and the outer wall; and

a vapor plug having a handle, a neck that is inserted into the opening, and a locking device that locks the vapor plug in place and maintains a gap between the neck and the inner wall that allows gas to escape; and

an electronic thermocouple embedded within the neck of the vapor plug,

wherein the neck of the vapor plug has a portion that is corrugated and includes a serpentine path, the serpentine path connecting the inner wall with the outer wall, and

wherein the neck of the vapor plug has a height that is less than a height of a straight neck tube.

12. The dewar of claim 11, wherein the vapor plug is further configured to be inserted into the payload area to plug the opening and prevent the liquid from entering or exiting the payload area.

13. The dewar of claim 12, wherein the vapor plug is a magnetic vapor plug.

14. The dewar of claim 13, wherein the magnetic vapor plug is configured to be rotated to a position in the payload area to secure the vapor plug to the payload area.

15. The dewar of claim 13, wherein the magnetic vapor plug is configured to be rotated to a position in the payload area where one or more magnets create force to push the magnetic vapor plug out of the payload area.

16. A spherical dewar for storing a liquid at a temperature below an ambient temperature, comprising:

a top portion;

a bottom portion that weighs more than the top portion and is configured to stabilize the spherical dewar in an upright position when the spherical dewar is tilted, angled or rotated within an enclosure regardless of an orientation of the enclosure;

an inner wall that forms a payload area configured to hold the liquid at the temperature below the ambient temperature;

an outer wall, the outer wall and the inner wall having an opening that allows access to the liquid in the payload area;

a vacuum port that is configured to produce a vacuum insulation between the inner wall and the outer wall;

a vapor plug having a handle, a neck that is inserted into the opening and a locking device that locks the vapor plug in place, prevents the vapor plug from falling out when the spherical dewar is oriented or rotated in different directions and maintains a gap between the neck and the inner wall that allows gas to escape when the liquid evaporates; and

an electronic thermocouple embedded within the neck of the vapor plug,

wherein the locking device includes one or more magnets embedded within an outer periphery of the neck, wherein the one or more magnets embedded within the outer periphery of the neck interlock with one or more other magnets within the inner wall of the spherical dewar,

wherein the one or more magnets embedded within the outer periphery of the neck of the vapor plug and the one or more other magnets within the inner wall of the spherical dewar are configured to maintain the gap between the neck of the vapor plug and the inner wall with the vapor plug in a first rotational position, and

wherein the one or more magnets embedded within the outer periphery of the neck of the vapor plug and the one or more other magnets within the inner wall of the spherical dewar are configured to maintain the vapor plug in a location at least partially out of the spherical dewar with the vapor plug in a second rotational position different from the first rotational position.

17. The spherical dewar of claim 16, wherein the one or more magnets embedded within the outer periphery of the neck of the vapor plug and the one or more magnets within the inner wall of the spherical dewar have opposing polarities, wherein the opposing polarities are configured to lock the vapor plug in the first rotational position within the spherical dewar and are configured to maintain the vapor plug in the location at least partially out of the spherical dewar with the vapor plug in the second rotational position.

18. The spherical dewar of claim 16, wherein the spherical dewar has a center of gravity or mass within the bottom portion.

~~19. The spherical dewar of claim 16, wherein the neck of the vapor plug has a height that is less than a height of a straight neck tube.~~

19~~20~~. The spherical dewar of claim 16, wherein the vapor plug is removable from the opening.