Summary of the Invention

[0008] In one aspect, a method of pre-charging an empty or partially empty insulated container with CO2 snow to create a pre-charged container at a first location for transport to a second location, comprising the steps of: receiving a liquid CO2 source at the first location; operably connecting a CO2 snow charger to the empty or the partially empty container and to the liquid CO2 source at the first location; generating the CO2 snow within the empty or the partially empty container to create the pre-charged container at the first location, without loading one or more perishable items; preparing the pre-charged container for delivery to the second location.

[0009] In a second aspect, a method of supplying a perishable item to a location, comprising the steps, of: receiving a pre-charged container at least partially filled with the CO2 snow inside the pre-charged container without one or more perishable items loaded therein; opening the pre-charged container at least partially filled with the CO2 snow; accessing an interior region of the pre-charged container at least partially filled with the CO2 snow; loading the perishable item into the pre-charged container at least partially filled with the CO2 snow, wherein the perishable item is in sufficient proximity to the CO2 snow to maintain a temperature of the perishable item below an upper limit; sealing the pre-charged container at least partially filled with the CO2 snow; preparing the pre-charged container at least partially filled with the CO2 snow with the perishable item therein for delivery to the location.

[0010] In a third aspect, a method of delivering at least partially depleted CO2 snow pre-charged container, comprising: receiving the at least partially depleted CO2 snow pre-charged container from a loading location where one or more perishable items have been loaded into the pre-charged container, said at least partially depleted CO2 snow pre-charged container further comprising the one or more perishable items in sufficient proximity to the CO2 snow to maintain the temperature of the one or more perishable items below an upper limit; opening the pre-charged container to access the interior of the pre-charged container; removing the one or more perishable items from the pre-charged container; and delivering the precharged container to a location for charging, loading additional perishable items or using at least a portion of the one or more perishable items remaining in the at least partially depleted container.

[0011] In a fourth aspect, a method of creating a pre-charged container with CO2 snow at a first location for transport to a second location, comprising the steps of: introducing the CO2 snow

Claims

1. A method of pre-charging an empty or partially empty insulated container with CO2 snow to create a pre-charged container at a first location for transport to a second location, comprising the steps of:

receiving a liquid CO2 source at the first location;

operably connecting a CO2 snow charger to the empty or the partially empty container and to the liquid CO2 source at the first location;

generating the CO2 snow within the empty or the partially empty container to create the pre-charged container at the first location, without loading one or more perishable items; and

preparing the pre-charged container for delivery to the second location.

2. The method of claim 1, wherein the step of preparing the pre-charged container for delivery to the second location, further comprises:

sealing the pre-charged container;

packaging the pre-charged container; and

providing the pre-charged container to a designated receiver or commercial carrier for ground or air delivery to the second location.

3. The method of claim 1, wherein the step of preparing the pre-charged container further comprises including a label with the pre-charged container, said label including shipping information of the second location.

4. The method of claim 1, wherein the step of preparing the pre-charged container includes packaging the pre-charged container with instructions to a final user for return of the pre-charged container.

5. The method of claim 1, further comprising the step of:

receiving an at least partially depleted container from the second location or other previous use location;

inspecting the at least partially depleted container,

and in response thereto,

generating CO2 snow in the at least partially depleted container to create a replenished, pre-charged container;

preparing said replenished, pre-charged container for delivery to the second location, the previous use location or another location.

6. The method of claim 1, wherein the first location comprises a pre-charging CO2 system adapted for pre-charging into the empty or partially empty insulated container with CO2 snow.

7. The method of claim 3, wherein the second location is a clinical site.

8. The method of claim 1, further comprising:

receiving notification that the pre-charged container with the CO2 snow is substantially depleted so as to create a substantially depleted container.

9. The method of claim 8, further comprising coordinating for return delivery of the substantially depleted container.

10 The method of claim 8, creating a second pre-charged container filled with CO2 snow pre-charged therein.

11. The method of claim 1, wherein the generating of the CO2 snow occurs in an automatic dispensing station or an automatic charging station.

12. The method of claim 1, further comprising:

receiving an at least partially depleted container without perishable item therein, said depleted container defined as a pre-charged container with CO2 snow therein whereby said CO2 snow has at least partially sublimed;

inspecting the at least partially depleted container;

determining the at least partially depleted container is re-usable;

re-filling the at least partially depleted container with CO2 snow to create a replenished pre-charged container with the CO2 snow;

preparing the replenished and pre-charged container for delivery.

13. A method of supplying a perishable item to a location, comprising the steps, of:

receiving a pre-charged container at least partially filled with CO2 snow inside the pre-charged container without one or more perishable items loaded therein;

opening the pre-charged container at least partially filled with the CO2 snow;

accessing an interior region of the pre-charged container at least partially filled with the CO2 snow;

loading the perishable item into the pre-charged container at least partially filled with the CO2 snow, wherein the perishable item is in sufficient proximity to the CO2 snow to maintain a temperature of the perishable item below an upper limit;

sealing the pre-charged container at least partially filled with the CO2 snow;

preparing the pre-charged container at least partially filled with the CO2 snow with the perishable item therein for delivery to the location.

14. The method of claim 13, wherein the step of preparing the pre-charged container with the perishable item therein for delivery further comprises the step of identifying the perishable item as a hazardous material.

15. The method of claim 13, further comprising:

receiving a partially depleted container from the location;

accessing an interior of the partially depleted container; and

loading a second perishable item into the partially depleted container without introducing additional CO2 snow into the partially depleted container.

16. The method of claim 13, further comprising placing the perishable item into a product holder followed by at least partially positioning the product holder with the perishable item therein in sufficient proximity to the CO2 snow to maintain the temperature of the perishable item below an upper limit.

17. The method of claim 16, wherein the temperature of the product holder is maintained below -70 degrees Celsius while in delivery to the final location.

18. The method of claim 13, further comprising providing instructions to a final user for return delivery of the pre-charged container.

19. The method of claim 13, wherein the step of preparing the pre-charged container with the perishable item loaded therein comprises configuring the pre-charged container ready for pick-up by a designated receiver or commercial carrier.

20. A method of delivering at least a partially depleted CO2 snow pre-charged container, comprising:

receiving the at least partially depleted CO2 snow pre-charged container from a loading location where one or more perishable items have been loaded into the pre-charged container, said at least partially depleted CO2 snow pre-charged container further comprising the one or more perishable items in sufficient proximity to the CO2 snow to maintain the temperature of the one or more perishable items below an upper limit;

opening the at least partially depleted CO2 snow pre-charged container to access the interior of the pre-charged container;

removing the one or more perishable items from the at least partially depleted CO2 snow pre-charged container; and

delivering the at least partially depleted CO2 snow precharged container to a location for charging, loading additional perishable items or using at least a portion of the one or more perishable items remaining in the at least partially depleted container CO2 snow pre-charged container.

21. The method of claim 20, further comprising:

notifying a supply location that the pre-charged container is substantially depleted, and in response thereto;

receiving from the supply location (i) the container replenished and filled with CO2 snow and comprising the one or more perishable items or (ii) a new pre-charged container filled with CO2 snow and comprising the one or more perishable items.

22. A method of creating a pre-charged container with CO2 snow at a first location for transport to a second location, comprising the steps of:

introducing the CO2 snow into an empty or partially empty container at the first location from a source of CO2 snow at the first location, without loading of one or more perishable items;

creating the pre-charged container at the first location; and

preparing the pre-charged container for delivery from the first location to the second location.

23. The method of claim 22, wherein the step of preparing the pre-charged container for delivery to the second location, further comprises:

sealing the pre-charged container; and

packaging the pre-charged container.

24. The method of claim 22, further comprising the step of providing the pre-charged container to a designated receiver or commercial carrier for ground or air delivery to the second location.

25. The method of claim 22, wherein the step of preparing the pre-charged container further comprises including shipping information.

26. The method of claim 22, wherein the step of preparing the pre-charged container includes packaging the pre-charged container with instructions to a final user for return of an at least partially depleted, pre-charged container.

27. The method of claim 22, further comprising:

receiving an at least partially depleted container from the second location or other previous use location;

inspecting the at least partially depleted container,

and in response thereto,

introducing CO2 snow in the at least partially depleted container to create a replenished, pre-charged container;

preparing said replenished, pre-charged container for delivery to the second location, the previous use location or another location.

28. The method of claim 22, further comprising:

the first location receiving notification from the second location or a third location that the pre-charged container with the CO2 snow is at least partially depleted or substantially depleted.

29. The method of claim 22, further comprising the first location coordinating for return delivery of the pre-charged container with the CO2 snow that is at least partially depleted or substantially depleted.

30. The method of claim 22, creating a second pre-charged container filled with CO2 snow pre-charged therein at the first location.

31. The method of claim 22, wherein the step of introducing the CO2 snow occurs manually or automatically.

32. The method of claim 22, further comprising:

the first location receiving an at least partially depleted container without perishable item therein, said at least partially depleted container defined as the pre-charged container with CO2 snow therein whereby said CO2 snow has at least partially sublimed;

inspecting the at least partially depleted container;

determining the at least partially depleted container is re-usable;

introducing into the at least partially depleted container CO2 snow to create a replenished and pre-charged container with the CO2 snow; and

preparing the replenished and pre-charged container for delivery.

33. A method of creating a pre-charged container with CO2 snow at a first location for transport to a second location, comprising the steps of:

introducing the CO2 snow into an empty or partially empty container at the first location from a source of CO2 snow at the first location;

creating the pre-charged container at the first location; and

preparing the pre-charged container for delivery from the first location to the second location;

receiving an at least partially depleted container from the second location or other previous use location;

inspecting the at least partially depleted container,

and in response thereto,

introducing CO2 snow in the at least partially depleted container to create a replenished, pre-charged container;

preparing said replenished, pre-charged container for delivery to the second location, the previous use location or another location.

34. A method of creating a pre-charged container with CO2 snow at a first location for transport to a second location, comprising the steps of:

introducing the CO2 snow into an empty or partially empty container at the first location from a source of CO2 snow at the first location;

creating the pre-charged container at the first location;

preparing the pre-charged container for delivery from the first location to the second location;

the first location subsequently receiving notification from the second location or a third location that the pre-charged container with the CO2 snow is at least partially depleted or substantially depleted.

35. A method of creating a pre-charged container with CO2 snow at a first location for transport to a second location and subsequently receiving the pre-charged container in a depleted state, comprising the steps of:

introducing the CO2 snow into an empty or partially empty container at the first location from a source of CO2 snow at the first location;

creating the pre-charged container at the first location; and

preparing the pre-charged container for delivery from the first location to the second location;

the first location subsequently receiving an at least partially depleted container without one or more perishable items therein, said at least partially depleted container defined as the pre-charged container with CO2 snow therein whereby said CO2 snow has at least partially sublimed;

inspecting the at least partially depleted container;

determining the at least partially depleted container is re-usable;

introducing into the at least partially depleted container CO2 snow to create a replenished and pre-charged container with the CO2 snow; and

preparing the replenished and pre-charged container for delivery.