

TITLE OF INVENTION

THERMAL INSULATED STORAGE CONTAINER AND METHOD OF PACKING PHARMACEUTICAL PRODUCTS USING THE SAME

5 BACKGROUND OF THE INVENTION

A. Field of The Invention

The present invention relates generally to portable and collapsible, thermal insulated storage container useful for keeping pharmaceutical products and the like, and in particular, an insulated device with waterproof and collapsible structure that is useful
10 to keep pharmaceutical products at a specific temperature range for a prolonged period of time.

B. Description of Prior Art

Cooling devices are invented to keep food, beverages and the like at low temperature. In the market there are containers made from rigid materials such as metal or plastics
15 or flexible materials such as fabric or foams. Most of the rigid cooling containers are designed to incorporate a plurality of wheels which facilitate transporting or allow individuals to carry the cooling container in private transport, like in vans or in cars. However, non-rigid cooling containers or collapsible cooling container can be provided with straps and/or handles and may in certain instances be made of lighter weight
20 materials to facilitate mobility. Collapsible cooling containers in general available in the market are ineffective and poor in cooling or in thermal insulation.

US Patent Publication No. 20140023295 discloses an insulated container and multipurpose mat, comprising: (i) a flexible panel, having a first outer surface, a second outer surface, and an edge joining the first and second outer surfaces; (ii) a
25 first strap length attached to the flexible panel such that a portion of the first strap length is adjacent a first portion of the edge; (iii) a second strap length attached to the flexible panel such that a portion of the second strap length is adjacent a second portion of the edge; (iv) a third strap length attached to the flexible panel such that a portion of the third strap length is adjacent a third portion of the edge; and (v) a fourth
30 strap length attached to the flexible panel such that a portion of the fourth strap length

is adjacent a fourth portion of the edge, wherein the first strap length is substantially diametrically opposed to the second strap length across the flexible panel on a first diametrical axis, the third strap length is substantially diametrically opposed to the fourth strap length across the flexible panel on a second diametrical axis, wherein: (a)
5 the first diametrical axis is orthogonal to the second diametrical axis.

US Patent Publication No. 20130341338 discloses a soft sided insulated container assembly including a first portion having an insulated, soft sided external wall structure, and a second portion that defined a lid co-operable with the first portion. The lid includes an auxiliary access opening and closure member that are smaller than the
10 main opening, and that can be operated one-handed. A rigid work surface is provided, typically immediately adjacent to the secondary closure member, the work surface providing a place for holding or mixing a drink or for preparing a snack. In some embodiments the work surface may be movable relative to the container, whether slidable in a co-planar or parallel planar manner in translation, or folding as in a
15 foldable shelf. The entire container assembly may be foldable or collapsible to a storage condition, and the rigid member, whether fixed or movable, does not impede that folding or collapsing.

US Patent Publication No. 20130174600 discloses a flexible container with internal thermal exchange. The container is formed into an envelope or bag cascade multi
20 pocket inside. It is an administrator, portable disposable dispenser of a consumer and/or necessity product to be heated or cooled, exploiting endothermic or exothermic reactions generated by breaking by pressure of the bag of the reactive liquid.

There are other various containers for cooling known in the prior art. Some prior art patents disclosing food coolers include U.S. Pat. No. 4,468,932, U.S. Pat. No.
25 5,953,933; and U.S. Pat. No. 6,763,665. Devices shown in these prior art patents are expensive and having complicated structure. Accordingly, there still remains a need for thermal insulated device that is simple enough to be made, inexpensive, portable, and durable.

30 SUMMARY OF THE INVENTION

A principal objective of the present invention is to provide a portable, durable, and collapsible thermal insulated storage container for pharmaceutical products, and the storage container is able to keep the pharmaceutical products in the compartment of the container for extended hours without temperature changes.

5 Aspects of the disclosure herein relate to a thermal insulated storage container (100) comprising;

(i) an outer fabric housing (10) having a plurality of sides and a flip closure (25) forming into a box like structure with the flip closure (25) being the opening of the housing (10);

10 (ii) a foam layer (20) being formed as an inner layer, located adjacent to said outer fabric housing (10), wherein the foam layer (20) is made to form a four-sided compartment (22) or the like within the fabric housing (10);

(iii) a plurality of vacuum panels (30) adjacent next to the foam layer (20) forming into a storage container (100) or the like within the compartment (22), wherein a bottom vacuum panel (30'') and a top vacuum panel (30') enclose the container (100), forming
15 into an enclosed and insulated container, and the foam layer (20) is located in between the outer fabric housing (10) and the foam layer (20), and the vacuum panels (30) provide insulation to insulate heat entering/leaving the compartment (22); and

(iv) a plurality of vertical supporting straps (50', 50'') and horizontal supporting
20 straps (60', 60'') which are mounted on the outer fabric housing (10) from one side of the housing (10) to the other side of the fabric housing (10), wherein the supporting straps (50', 50'', 60', 60'') are mounted with a pair of carrying handles (40) which facilitate transporting of the thermal insulated storage container (100);

thereby the thermal insulated storage container (100) provides thermal insulation to
25 pharmaceutical products that are kept within the compartment (22) of the storage container (100).

Another main object of the present invention is to provide a method of packing pharmaceutical products to allow the pharmaceutical product to maintain at a predetermined temperature range for an extended period of time comprising the steps
30 of:

- (i) preparing an outer fabric housing (10) having a plurality of sides and a flip closure (25) forming into a box like structure with the flip closure (25) being the opening of the housing (10);
- (ii) setting up a foam layer (20) as an inner layer, located adjacent to said outer fabric housing (10), wherein the foam layer (20) is made to form a four-sided compartment (22);
- (iii) installing a plurality of vacuum panels (30) adjacent next to the foam layer (20) forming into a container (100) or the like within the compartment (22), wherein a bottom vacuum panel (30'') and a top vacuum panel (30') enclose the container (100), forming into an enclosed and insulated container (100), and
- (iv) mounting a plurality of vertical supporting straps (50', 50'') and horizontal supporting straps (60', 60'') on the outer fabric housing (10) from one side of the fabric housing (10) to the other side of the fabric housing (10), wherein the supporting straps are mounted with a pair of carrying handles (40) which facilitate transporting of the insulated storage container (100), thereby the thermal insulated storage container (100) provides thermal insulation to products containing within the compartment (22) of the storage container (100).

Yet still a further object of the present invention is to provide a thermal insulated storage container, wherein a corner protector (81) is used to secure the interlock between each edge of the vacuum panel (30) to harness insulation of the compartment (22), and the foam layer (20) is provided with a visual window (24) allowing the viewing of the vacuum panel (30) forming the compartment (22).

Another object of the present invention is to provide a thermal insulated storage container, wherein the flip closure (25) is used to substantially seal the storage container (100), and the flip closure (25) is provided with a zipping device (26) along the edge of the flip closure (25), the zipping device (26) being a zipper with a plurality of zipper teeth, and the zipper (26) encircles the edge of the flip closure (25) of the container (100) and permits access to the compartment (22) of the container (100) if the zipper (26) is unzipped.

Still yet another object of the present invention is to provide a thermal insulated storage container, wherein a heat gain rate of the insulated storage container (100) is approximately 0.1-0/5 °C/hr.

5 A further yet another object of the present invention is to provide a thermal insulated storage container (100), wherein the foam layer (20) is loosely positioned between the outer fabric housing (10) and the vacuum panels (30), and the outer fabric housing (10) is made from laminated nylon fabric or the like, wherein the carrying handles (40) are mounted on the outer fabric housing (10), facilitating the lifting and transporting of the storage container (100).

10 Yet another object of the present invention is to provide a thermal insulated storage container (100), wherein the vacuum panels (30) are protected by the foam layer (20) which are made from an Expanded Polyethylene Sheet (EPE), and the supporting straps (50', 50'', 60', 60'') are mounted along the exterior of the outer fabric housing (10) and along the interior of the outer fabric housing (10).

15 Another object of the present invention is to provide a thermal insulated storage container (100), wherein the container (100) has the sizes ranging from xx cm to xx cm, and the carrying handle (40) are centrally located at the upper edges of the side panel of the outer fabric housing (10).

20 Still a further object of the present invention is to provide a thermal insulated storage container (100), wherein a cable is used to tie the foam layer (20) around the plurality of vacuum panel (30) to protect the vacuum panels (30), and the outer fabric housing (10) is provided with a security eyelet for cable tie of the container (100) so as to secure the pharmaceutical products in the compartment (22).

25 These and other features, aspects and advantages of the present invention will become better understood with reference to the following drawings, description and claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1A is a perspective view of an example thermal insulated storage container in accordance with an aspect of the present invention;

FIG. 1B is the top view of the thermal insulated storage container in accordance with the present invention, wherein pharmaceutical products are located within the compartment of the container.

FIG. 2A is a perspective view showing the outer fabric (10) of the thermal insulated storage container (100) having four vertical wall (11) in accordance with the present invention;

FIG. 2B shows the bottom view of the bottom wall (11') of the thermal insulated storage container (100) in accordance with the present invention;

FIG. 2C shows the lateral side (42) of the thermal insulated storage container (100) in accordance with the present invention.

FIG. 3A is a schematic perspective view of the supporting straps (50', 50", 60', 60") mounted on the outer fabric housing of the thermal insulated storage container (100) of the present invention.

FIG. 3B is a perspective view showing the mounted carrying handle (40) positioned on the outer fabric housing (10) facilitating delivery of the thermal insulated storage container (100) in accordance with the present invention.

FIG. 4 is a perspective view showing the interior of the box-like compartment (22) formed by the outer fabric housing (10) in accordance with the present invention,

FIG. 5 shows a side view of the thermal insulated storage container (100) in accordance with the present invention.

FIG. 6 illustrates a security eyelet (60) for cable positioned on the flip closure (25) of the outer fabric housing (10) in accordance with the present invention.

FIG. 7 schematically shows the top view of the compartment (22), wherein the foam layer (10) is mounted in adjacent to the outer fabric housing (10) within the compartment (22) of the thermal insulated storage container (100) of the present invention, wherein a vision window (24) is provided on the foam layer (20).

FIG. 8 schematically shows the foam layer (20), wherein the corner thereof is mounted with a corner protector (81) to harness thermal insulation of the compartment of the thermal storage container (100) of the present invention.

FIG. 9 indicates the structure of the vacuum panel (30) of the thermal storage container (100) in accordance with the present invention.

FIG. 10 shows the top view of the thermal insulated storage container (100) in accordance with the present invention, wherein the compartment (22) is mounted with a top vacuum panel (30') before the closure of the outer fabric housing (10) to cover the entire storage container (100).

DETAILED DESCRIPTION OF THE INVENTION

The following detailed description is of the best currently contemplated modes of carrying out exemplary embodiments of the invention. The description is not to be taken in a limiting sense, but is made merely for the purpose of illustrating the general principles of the invention, since the scope of the invention is best defined by the appended claims.

Referring to FIG. 1A, there is shown a perspective view of an example thermal insulated storage container (100) in accordance with an aspect of the present invention. Broadly, the thermal insulated storage container (100) is box-like structure, such as rectangular box or an enclosed square box, wherein the external surface of the thermal insulated storage container (100) is the outer fabric housing (10). The outer fabric housing (10) in general is made from water proof and durable materials, such as Nylon or Polyester, or GORE-TEX, etc. available in the market. A preferred shape of the thermal insulated storage container (100) is rectangular or square in appearance. FIG. 1B is the top view of the thermal insulated storage container (100) in accordance with the present invention, wherein pharmaceutical products (120) are located within the compartment (22) of the container (100).

FIG. 2A is a perspective view showing the outer fabric housing (10) of the thermal insulated storage container (100) in accordance with the present invention. In a preferred embodiment, the outer fabric housing (10) is made into a rectangular box, wherein there are four vertical walls (11), a bottom plate (11'), and a flip closure (25) (shown in FIG. 1). The interior of the outer fabric housing (10) formed by the vertical walls (11) and the bottom plate (11') is the compartment (22) of the storage container (100) in accordance with the present invention. Along the edge of the flip closure (25), a zipping device (26) or a zipper having a plurality of zipping teeth is mounted so that

the outer fabric housing (10) can be zipped to form an enclosed box to contain pharmaceutical products (120). FIG. 2B shows the bottom view of the thermal insulated storage container (100) and FIG. 2C shows the lateral view of the thermal insulated storage container (100) in accordance with the present invention. A carrying handle (40) is each provided at the side of the outer fabric housing (10) at a position closer to the flip closure (25) of the outer fabric housing (10), at opposite of the outer fabric housing (10).

FIG. 3A is a schematic view of the supporting straps (50', 50'', 60', 60'') mounted on the outer fabric housing (10) of the thermal insulated storage container (100) of the present invention. FIG. 3B is a perspective view showing the mounted carrying handle (40) positioned on the outer fabric housing (10) facilitating delivery of the thermal insulated storage container (100) in accordance with the present invention. As shown in the FIG. 3A, the supporting straps (50', 50'', 60', 60'') are consisting of a first horizontal supporting strap (50') and a second horizontal supporting strap (50''), and a first vertical supporting strap (60') and a second vertical supporting strap (60''). These supporting straps (50', 50'', 60', 60'') form into a robust skeleton structure which can rigidly support the storage container (100) in accordance with the present invention. The number of supporting straps (50', 50'', 60', 60'') can be increased if required, such that the insulated storage container (100) is well supported. Any other form of supporting straps may be used to strengthen the supporting of the thermal insulated storage container (100) in accordance with the present invention. The carrying handle (40) as shown in FIG. 3B facilitates the transporting of the thermal insulated storage container (100) by two persons.

FIG. 1B is the top view of the thermal insulated storage container (100) in accordance with the present invention, wherein varieties of pharmaceutical products (120) are kept within the compartment (22) of the container (100). As shown in the FIG. 1B, the thermal insulated storage container (100) comprises

- (i) an outer fabric housing (10) which has a plurality of sides, that is the four vertical wall (11) and a bottom plate (11') and a flip closure (25) forming into a box-like structuring, wherein the flip closure (25) is the opening of the container (100);
- (ii) a foam layer (20) being formed as an inner layer of the compartment (20), located adjacent to the outer fabric housing (10), wherein the foam layer (20) is made

to form a four-sided compartment (22) or the like and the foam layer (20) provides insulation to insulate heat entering the compartment (22);

(iii) a plurality of vacuum panels (30) having a cavity adjacent next to the foam layer (20) forming into a cavity or the like within the compartment (22), wherein a bottom vacuum panel (30'') and a top vacuum panel (30') engage along the vertical edges thereof, forming into an enclosed and insulated container (100), and the foam layer (20) is located in between the outer fabric housing (10) and the foam layer (20). In accordance with the present invention, the outer fabric housing (10) is made from laminated nylon fabric or the like. The cavity of the vacuum panels (30) is filled with a phase change material (PCM), such as paraffin wax, xxx, etc. PCMs are used to provide thermal barriers and/or insulation.

In the preferred embodiment of the present invention, the thermal insulated storage container (100) provides a heat gain rate of approximately 0.1-0/5 °C/hr.

As shown in FIG. 3A, the thermal insulated storage container (100) has a plurality of vertical supporting straps (50', 50'') and horizontal supporting straps (60', 60'') which are mounted on the outer fabric housing (10) from one side of the fabric housing (10) to the other side of the fabric housing (10), wherein the supporting straps are mounted with a pair of carrying handles (40) which facilitate transporting of the insulated storage container, as shown in FIG. 3B, wherein the carrying handle (40) centrally located at the opposed upper edges of the side wall (11) of the outer fabric housing (10).

In the preferred embodiment as shown in FIG. 3B, the carrying handles (40) can be constructed from nylon material and the same material is also suitable for the supporting straps (50', 50'', 60' 60''). Other materials suitable for the carrying handles and the supporting straps (50', 50'', 60' 60'') may include polypropylene, neoprene, polyester, etc. The carry handles (40) and supporting straps (50', 50'', 60' 60'') are securely mounted to the outer fabric housing (10) by stitching or polymer welding.

In accordance with the present invention, the thermal insulated storage container (100) provides thermal insulation to material, such as pharmaceutical products (120), that contain within the compartment (22) of the storage container (100) which is almost thermal insulated.

As shown in FIG. 1B, wherein the vacuum panel (30) is provided with vertical wedged side which is 45 degrees to be able to interlock with the edge of another vacuum panel (30). The 45° wedged shape at the edge of the vacuum panel (30) facilitates interlocking with another vacuum panel (30) when a compartment (22) is formed by the plurality of vacuum panels (30), and the vacuum panels (30) are protected by the foam layers (30) which are made from an Expanded Polyethylene Sheet (EPE).

FIG. 4 is a perspective view showing the box-like outer fabric housing (10) in accordance with the present invention, wherein the flip closure (25) which is the top of the housing (10) is lifted and the compartment (22) is shown with the vertical straps (60', 60''), wherein the straps (50', 50'', 60', 60'') are mounted both along the exterior of the outer fabric housing (10) and along the interior of the outer fabric housing (10). In the present preferred embodiment, the flip closure (25) is substantially waterproof to prevent liquid contents from either entering the compartment (22) of the storage container (100). Additionally, the flip closure (25) is maintained in a flat plane to provide water proof and a tight seal.

The flip closure (25) is used to substantially seal the storage container (100), and the flip closure (25) is provided with a zipping device (26) along the edge of the flip closure (25), the zipping device (26) being a zipper with a plurality of zipper teeth, and the zipper (26) encircles the edge of the flip closure (25) of the container (100) and permits access to the compartment (22) of the container (100) if the zipper (26) is unzipped.

In accordance with the present invention the thermal insulated storage container (100) has the sizes ranging from xx cm to xx cm.

FIG. 5 shows a side view of the thermal insulated storage container in accordance with the present invention.

FIG. 6 illustrates a security eyelet (60) for cable tie formed on the flip closure (25) of the outer fabric housing (10) in accordance with the present invention, wherein a cable is used to tie the foam layer (20) around the plurality of vacuum panels (30) to protect the vacuum panels (30), and to secure the pharmaceutical products (120) within the compartment (22).

FIG. 7 schematically shows the top view of the compartment (22), wherein the foam layer (20) is mounted in adjacent to the outer fabric housing (10) within the

compartment (22) of the thermal insulated storage container (100) of the present invention.

FIG. 8 schematically shows the foam layer (20) wherein the corner thereof is mounted with a corner protector (81) to harness thermal insulation of the compartment (22) of the thermal storage container (100) of the present invention. FIG. 9 indicates the structure of the vacuum panel (30) of the thermal storage container (100) in accordance with the present invention.

FIG. 10 shows the top view of the thermal insulated storage container (100) in accordance with the present invention, wherein the compartment (22) is mounted with a top vacuum panel (30) before the closure of the outer fabric housing (10) covers the entire container (100).

In another preferred embodiment of the present invention, a method of packing pharmaceutical products to maintain a predetermined temperature range for an extended period of time is disclosed. Referring now to FIG. 1B again, the thermal insulated storage container (100) is shown, and storage container (100) includes (i) an outer fabric housing (10) having a plurality of vertical sides forming into a box-like compartment (22); (ii) a foam layer (20) being formed as an inner layer of the compartment (22), and (iii) a plurality of vacuum panels (30) adjacent to the foam layer (20) forming into a thermal insulated storage container (100). The method comprises the steps of:

- (i) preparing an outer fabric housing (10) to form into a compartment (22);
- (ii) setting up foam layer (20) as an inner layer, located adjacent to the outer fabric housing (10),
- (iii) installing a plurality of vacuum panels (30) adjacent next to the foam layer (20) forming into a container or the like within the compartment (22), wherein a bottom vacuum panel (30'') and a top vacuum panel (30') close the compartment (22), forming into an enclosed and thermal insulated container (100), and
- (iv) mounting a plurality of vertical supporting straps (50', 50'') and horizontal supporting straps (60', 60'') which are mounted on the outer fabric housing (10) from one side of the housing (10) to the other side of the fabric housing (10), wherein the horizontal and vertical supporting straps (50', 50'', 60', 60'') are mounted with a pair of

carrying handles (40) which facilitate transporting of the insulated storage container, thereby the storage container (100) provides thermal insulation to pharmaceutical products that contain within the compartment of the storage container (100). The vacuum panels (30) are filled with a Phase Change Material.

- 5 The pharmaceutical products (120) are kept within the compartment (22) of the thermal insulated storage container (100) and the top vacuum panel (30') is placed on top of the compartment (22) so as to seal the container (100). Then the flip-closure (25) closes the compartment (22) which is thermally sealed by the top vacuum panel (30') and the vertical vacuum panels (30).
- 10 The foregoing is illustrative of the present invention and is not to be construed as limiting thereof. Although exemplary embodiments of this invention have been described, those skilled in the art will readily appreciate that many modifications are possible in the exemplary embodiments without materially departing from the novel teachings and advantages of this invention. Accordingly, all such modifications are
- 15 intended to be included within the scope of this invention as defined in the claims. This invention is defined by the following claims, with equivalents of the claims to be included therein.

CLAIMS

1. A thermal insulated storage container (100) comprising;
 - (i) an outer fabric housing (10) which has a plurality of sides and flip closure (25) forming into a box-like structure, where the flip closure (25) is on opening of the structure;
 - (ii) a foam layer (20) being formed as an inner layer, located adjacent to said outer fabric housing (10), wherein the foam layer (20) can be made to form a four-sided compartment (22) or the like, said foam layer (20) within the fabric housing (10) provides insulation to insulate heat entering the compartment (22);
 - (iii) a plurality of vacuum panels (30) with a cavity filled with PCM, adjacent next to the foam layer (20) forming into a container or the like within the compartment (22) , wherein a bottom vacuum panel (30'') and a top vacuum panel (30') enclose the container, forming into an enclosed and insulated container, and the foam layer (20) is located in between the outer fabric housing (10) and the foam layer (20);
 - (iv) a plurality of vertical supporting straps (50', 50'') and horizontal supporting straps (60', 60'') which are mounted on the outer fabric housing (10) from one side of the housing (10) to the other side of the fabric housing (10), wherein the supporting straps are mounted with a pair of carrying handles (40) which facilitate transporting of the insulated storage container;

thereby the storage container (100) provides thermal insulation to material that contain within the compartment of the storage container (100) which is thermal insulated.
2. The thermal insulated storage container as set forth in Claim 1, wherein the vacuum panels (30) are provided with vertical edges which are wedged in 45 degrees to be able to interlock with the edge of another vacuum panel (30).
3. The thermal insulated storage container as set forth in Claim 2, wherein a corner protector (81) is used to secure the interlock between each of the

wedged side of the vacuum panel (30) to harness insulation of the compartment (22).

- 5 4. The thermal insulated storage container as set forth in Claim 1, wherein the foam layer (20) is provided with a visual window (24) allowing the viewing of the vacuum panel (30) forming the compartment (22).
- 10 5. The thermal insulated storage container as set forth in Claim 1, wherein the outer fabric housing (10) is provided with a closure (25) adapted to substantially seal the storage container (100).
- 15 6. The thermal insulated storage container (100) as set forth in Claim 1, wherein a heat gain rate of the insulated storage container is approximately 0.1-0/5 °C/hr.
- 20 7. The thermal insulated storage container (100) as set forth in Claim 1, wherein the foam layer (20) is loosely located in between the outer fabric housing (10) and the vacuum panels (30).
- 25 8. The thermal insulated storage container (100) as set forth in Claim 5, wherein the flip closure (25) is provided with a zipping device (26) along the edge of the closure, the zipping device being a zipper with a plurality of zipper teeth.
- 30 9. The thermal insulated storage container (100) as set forth in Claim 1, wherein the outer fabric housing (10) is made from laminated nylon fabric or the like.
10. The thermal insulated storage container (100) as set forth in Claim 1, wherein the carrying handles (40) are mounted on the outer fabric housing, facilitating the lifting and transporting of the container (100).
11. The thermal insulated storage container (100) as set forth in Claim 1, wherein the vacuum panels (30) are protected by the foam layers which are made from an Expanded Polyethylene Sheet (EPE).

12. The thermal insulated storage container (100) as set forth in Claim 1, wherein the straps (50', 50'', 60', 60'') are mounted along the exterior of the outer fabric housing and along the interior of the outer fabric (10).
- 5 13. The thermal insulated storage container (100) as set forth in Claim 1, wherein the container has the sizes ranging from xx cm to xx cm.
- 10 14. The thermal insulated storage container (100) as set forth in Claim 1, wherein the carrying handle (40) centrally located at the opposed upper edges of the side panel of the outer fabric housing (10).
- 15 15. The thermal insulated storage container (100) as set forth in Claim 8, wherein the zipper encircles the edge of the closure of the container and permit access to the compartment of the container (100) if the zipper is unzipped.
16. The thermal insulated storage container (100) as set forth in Claim 1, wherein a cable is used to tie the foam layer () around the plurality of vacuum panel (30) to protect the vacuum panels (30).
- 20 17. The thermal insulated storage container (100) as set forth in Claim 1, wherein the outer fabric housing (10) is provided with a security eyelet for cable tie of the container (100) so as to secure the pharmaceutical products in the compartment (22).
- 25 18. A method of packing pharmaceutical products to maintain a predetermined temperature range for an extended period of time comprising the steps of:
- (i) preparing an outer fabric housing to form into a compartment (22);
 - (ii) setting up foam layer as an inner layer, located adjacent to said outer fabric housing (10),
 - 30 (iii) installing a plurality of vacuum panels (30) adjacent next to the foam layer (20) forming into a container or the like within the compartment (22), wherein a bottom vacuum panel (30'') and a top vacuum panel (30') enclose the container, forming into an enclosed and insulated container, and

- (iv) mounting a plurality of vertical supporting straps (50', 50'') and horizontal supporting straps (60', 60'') which are mounted on the outer fabric housing (10) from one side of the housing (10) to the other side of the fabric housing (10), wherein the supporting straps are mounted with a pair of carrying handles (40) which facilitate transporting of the insulated storage container, thereby the storage container (100) provides thermal insulation to material that contain within the compartment of the storage container (100) which is almost thermal insulated with no heat loss or increase.

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19. The method of Claim 18, wherein the panels (30) are provided with a 45° interlocking along the edge of each panel (30) so as to stably secure the panels (30) in place and to minimise heat loss through gaps forming from between the interlocking of the vacuum panels (30).

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20. The method of Claim 18, wherein a flip closure (25) is formed on the outer fabric housing (10) to be opened to access to the compartment (22) of the container (100) to access the pharmaceutical product (120) therein.

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21. The thermal insulated storage container (100) as set forth in Claim 1, wherein the plurality of vacuum panels (30) the top vacuum panel (30'), and the bottom vacuum panel (30'') are filled with a phase change material (PCM).

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22. The method of Claim 18, wherein the vacuum panels (30) the top and the bottom vacuum panel (30'') are filled with a phase change material (PCM).