

FOLDABLE OPEN TOP CONTAINER

1. TECHNICAL FIELD OF THE INVENTION

The present invention relates generally to a foldable open top container comprised of a removable top closure, an inner sleeve, an outer sleeve, a top end
5 frame, a bottom end cap and at least one locking means whereby said container can be easily assembled and disassembled through said locking means.

2. BACKGROUND OF THE INVENTION

Containers such as drums, tanks or intermediate bulk container (IBC) are often used to store a variety of products such as solid materials, liquid materials,
10 semi-liquid materials and the like. Such drums or other similar containers are commonly made of plastic, steel or fiber. Generally, there are two types of drums, which are tight head drums and open top drums. A tight head drum is a drum in which the top is not removable and it has bung hole in the top that allows the insertion of a faucet or a pump. Said tight head drum is usually used to store
15 liquid material. Liquid material can be drawn off by pump suction from the top of the drum. An open top drum is a drum in which the entire top of the drum is removable and is usually used for storing solid or semi solid materials. The materials stored in said open top drum are removed by first removing the top of the drum and then pumping or pouring the materials out.

20 Oftentimes, filling and/or discharging of semi-liquid material is troublesome or even impossible if a tight head drum is used. This is due to the high viscosity of the semi-liquid material and therefore the operation is complex and time consuming.

Open top drums are frequently used for shipping products due to their
25 ease of handling and versatility. Open top drums are desirable because the user can access the drum contents easily, for example, loading and unloading of the materials easily and quickly. However, the conventional open top drum is more costly than a closed top drum and the open top drum is non folding and

therefore cannot be easily nor economically reused due to the high cost of repositioning.

Nowadays, users are constantly looking for an improved-typed of drum design of open top drum that is simple and fast to fill and / or discharge while
5 at the same time is foldable and economical to reuse.

It would hence be extremely advantageous if the above shortcoming is alleviated by having a foldable open top container that can be disassembled and folded such that it may be shipped and stored in a relatively flat position when not in use. The foldable open top container of the present invention allows for a
10 shipper to send the container filled one way and when empty can be folded for returning to the original shipper so that the said open top container can be reused in future. Said foldable open top container is more economical than conventional rigid open top containers and provides a lower overall carbon foot print.

15 3. SUMMARY OF THE INVENTION

Accordingly, it is the primary aim of the present invention to provide a foldable open top container which is capable of being folded when empty and shipped or stored in the relatively flat position when not in use and thereby conserve space in storage or shipment.

20 It is yet another object of the present invention to provide a foldable open top container whereby products such as solid materials, liquid materials, semi-liquid materials and the like can be loaded into said container or unloaded from said container easily.

It is yet another object of the present invention to provide a foldable open
25 top container capable of reducing the carbon foot print of recycling the said container.

It is yet another object of the present invention to provide a foldable open top container that can be folded relatively in a 2.5 to 1 ratio when empty and return to the original shipper for reuse.

It is yet another object of the present invention to provide a foldable open top container that is provided with reusable top and bottom.

Another object of the present invention is to provide a foldable open top container that has an integral pallet designed into the bottom to facilitate
5 lifting of said container to a desired location.

Another object of the present invention is to provide a foldable open top container that has an inner flexible liner that retains the product loaded into the drum. The flexible liner is disposable and replaced new for each reuse.

Other and further objects of the invention will become apparent with an
10 understanding of the following detailed description of the invention or upon employment of the invention in practice.

According to a preferred embodiment of the present invention, there is provided:

An open top container comprising:

- 15 a top closure (110) to cover top portion of said container;
- a top end frame (140) at the open top of said container;
- a bottom end cap (150) at the closed bottom of said container;
- an inner sleeve (120) to define the inner shell of said container;
- an outer sleeve (130) to define the outer shell of said container; and
- 20 a disposable inner liner to contain the product;

characterized in that said open top container is a polygonal-shaped foldable container with said inner sleeve (120) being positioned within said outer sleeve (130); wherein each of said inner sleeve (120) and said outer sleeve (130) is formed from one or two pieces of sheet material; wherein said open top
25 container can be easily assembled and disassembled through at least one locking means (160);

further characterized in that said top end frame (140) comprises of at least a pair of opposing guiding loops (230) and said bottom end cap (150) comprises of at least a pair of opposing slots (330) for receiving said locking means (160).

In another aspect there is provided:

A method of assembling an open top container comprising steps of:

assembling and folding an inner sleeve (120) and an outer sleeve (130) through their respective scored lines to form the shape of the container body;

placing said inner sleeve (120) within the interior side of said outer sleeve (130) to form the inner shell and the outer shell of said container;

placing a top end frame (140) on the upper end of said inner sleeve (120) and said outer sleeve (130) and placing a bottom end cap (150) at the lower end of said inner sleeve (120) and said outer sleeve (130); wherein said top end frame (140) comprises of at least a pair of opposing guiding slots (230) and said bottom end cap (150) comprises of at least a pair of opposing guiding slots (330); and

placing at least one locking means (160) to hold said top end frame (140) and said bottom end cap (150) in place to said inner sleeve (120) and said outer sleeve (130); wherein said locking means (160) comprises of at least one reinforcing strap (160) that travels between the outer wall of said inner sleeve (120) and the inner wall of said outer sleeve (130) through said pair of opposing guiding loops (230) at said top end frame (140) and said pair of its corresponding opposing guiding slots (330) at said bottom end cap (150); wherein one end of said strap (160) is positioned at the passageway formed between said inner sleeve (120) and said outer sleeve (130) while the other end of said strap (160) is positioned at the opposing passageway; both ends of said strap (160) are tensioned and heat sealed (190) therein respectively.

4. BRIEF DESCRIPTION OF THE DRAWINGS

Other aspect of the present invention and their advantages will be discerned after studying the Detailed Description in conjunction with the accompanying drawings in which:

5 FIG. 1-A shows a cross section view of a foldable open top container of the present invention.

FIG. 1-B shows a cross section view of a foldable open top container of the present invention which is further comprised of a reinforcing middle sleeve.

FIG. 2 shows a top view of a top end frame of foldable open top container
10 in accordance with an exemplary embodiment of the present invention.

FIG. 3 shows a perspective view of a bottom end cap of said open top container.

FIG. 4 shows a perspective view of the top end frame of said open top container.

15 5. DETAILED DESCRIPTION OF THE DRAWINGS

In the following detailed description, numerous specific details are set forth in order to provide a thorough understanding of the invention. However, it will be understood by those with ordinary skill in the art that the invention may be practiced without these specific details. In other instances, well known
20 methods, procedures and/or components have not been described in detail so as not to obscure the invention.

The invention will be more clearly understood from the following description of the embodiments thereof, given by way of example only with reference to the accompanying drawings that are not drawn to scale.

25 Referring now to FIG. 1-A, there is shown a cross section view of the foldable open top container of the present invention. Said foldable open top container comprises a removable top closure (110), a top end frame (140), a bottom end cap (150), an inner sleeve (120) and an outer sleeve (130). This is further substantiated by FIG. 2, showing a top view of the top end frame (140) of
30 said foldable open top container in accordance with an exemplary embodiment

of the present invention. Particularly, said container is polygonal open-top drum formed from one piece of inner sleeve (120) and one piece of outer sleeve (130) which can be assembled or disassembled in a simple and expeditious manner. In an exemplary embodiment of the present invention, said foldable open top
5 container is an octagonal-shaped container. However, it shall be understood by the person skilled in the art that said container may form from any other geometric shape without departing from the scope of the exemplary embodiment. Hereinafter, octagonal-shaped open top container will be used as an example to describe assembling of said open top container.

10 Said inner sleeve (120) and said outer sleeve (130) are semi-ridge sleeves, whereby one sleeve is within the other to form the inner shell and the outer shell of the container side walls individually. Said inner sleeve (120) is positioned within the interior side of said outer sleeve (130) to form the inner shell and the outer shell of said container. Each of said inner sleeve (120) and said outer sleeve
15 (130) comprises of a series of flat elongated sidewall panels. Said inner sleeve (120) and said outer sleeve (130) is illustrated herein as being octagonal to include eight sidewall panels. The width for each of the sidewall panels of said inner sleeve (120) is substantially the same or slightly smaller than the width for each of the sidewall panels of said outer sleeve (130). Said inner sleeve (120) and
20 said outer sleeve (130) are made from thermoplastic materials such as fluted polypropylene or polyethylene sheet.

As said inner sleeve (120) and said outer sleeve (130) is a one or two piece inner sleeve (120) and a one or two piece outer sleeve (130) respectively, each of said elongated sidewall panels is connected to its adjacent panels through the
25 scored lines (not shown). Each of said inner sleeve (120) and said outer sleeve (130) is formed from one piece of sheet material whereby both end of the sheet material are joined together by heat welding to complete a shape such as octagonal shape of said inner sleeve (120) and said outer sleeve (130) respectively.

Referring now to FIG. 3, there is shown a perspective view of the bottom end cap (150) of said open top container. Said bottom end cap (150) is the closed bottom of said container comprises of a substantially planar surface (340) and a side wall (320) that is circumferential on said planar surface (340) and extended substantially perpendicular from said planar surface (340) to a predefined height. The diameter of said side wall (320) can be substantially the same or smaller than the diameter of said planar surface (340). Preferably, the diameter of said side wall (320) is smaller than the diameter of said planar surface (340) so that a lip (310) is formed around the edge of said bottom end cap (150). Said bottom end cap (150) further comprises of at least a pair of slots (330) that is positioned between said lip (310) and the exterior side wall (320), whereby said pair of slots (330) is positioned at the opposite end between each other.

Referring now to FIG. 4, there is shown a perspective view of the top end frame (140) of said open top container. Said top end frame (140) is the open top of said container comprises of an open center (240) and a side wall (220) that is circumferential on said top end frame (140) and extended substantially perpendicular from said top end frame (140) to a predefined height. The outer diameter of said side wall (220) can be substantially the same or smaller than the outer diameter of said top end frame (140). Preferably, the outer diameter of said side wall (220) is smaller than the outer diameter of said top end frame (140) so that a lip (210) is formed around the edge of said top end frame (140). Said open center (240) would define the open top of said container of the present invention for filling or discharging of material. Correspondingly, said top end frame (140) also further comprises of at least a pair of guiding loops (230) that is positioned between said lip (210) and the exterior side wall (220), whereby said pair of guiding loops (230) is positioned at the opposite end between each other. Each of said pair of guiding loops (230) is provided with two slots that may be slightly recessed into said top end frame (140). Accordingly, the positioning of said guiding loop (230) at said top end frame (140) is vertically in alignment with its corresponding slot (330) at said bottom end cap (150).

Both of said top end frame (140) and said bottom end cap (150) can be made from polymer materials such as polypropylene, polyethylene or other thermoplastics which are capable of being injection molded. The lip (210) of top end frame (140) and the lip (310) of bottom end cap (150) include but not limited
5 to octagonal shape as other geometry shape can be adopted without departing from the scope of the exemplary embodiment.

As shown in FIG. 1-A, said removable top closure (110) is provided on said top end frame (140) to cover top portion of said open top container. Said removable top closure (110) is a substantially planar surface includes but not
10 limited to octagonal shape as other geometry shape can be adopted as long as it is capable to cover said container securely. Said top closure (110) can be connected to said top end frame (140) by fastening at least one edge of said top closure (110) to one edge of said top end frame (140) by using of fastening means (not shown) such as but not limited to at least one strap to secure the position of
15 said top closure (110). The connection of said top closure (110) and said top end frame (140) is through at least one fastening hole (not shown) at said top closure (110) and its corresponding receiving hole (not shown) at said top end frame (140). When said container is to be transferred to another location together with the filled material in said container, said top closure (110) can be secured by
20 using of additional strap to join said top closure (110) and said top end frame (140) through additional fastening holes and receiving holes which are positioned at the peripheral of said top closure (110) and said top end frame (140) respectively. Alternatively, said guiding loop (230) can be used as the receiving hole to secure said top closure (110) with said top end frame (140).

25 During the assembling of said open top container, both of said inner sleeve (120) and said outer sleeve (130) are readily to be folded through their respective scored lines to form an octagonal-shaped container body. Said inner sleeve (120) is positioned within said outer sleeve (130) to form the inner shell and the outer shell of said container. Said top end frame (140) is positioned on
30 the upper end of said inner sleeve (120) and said outer sleeve (130) whereby the

side wall (220) of said top end frame (140) is being inserted into the upper portion of the gap between said inner sleeve (120) and said outer sleeve (130) and the arrangement is such that the side wall (220) of said top end frame (140) is being sandwiched and fits snugly between said inner sleeve (120) and said
5 outer sleeve (130). While said bottom end cap (150) is positioned at the lower end of said inner sleeve (120) and said outer sleeve (130) whereby the side wall (320) of said bottom end cap (150) is being inserted into the lower portion of the gap between said inner sleeve (120) and said outer sleeve (130) and the arrangement is such that the side wall (320) of said bottom end cap (150) is being
10 sandwiched and fits snugly between said inner sleeve (120) and said outer sleeve (130).

Said top end frame (140) and said bottom end cap (150) are held in place to said inner sleeve (120) and said outer sleeve (130) by using of locking means (160). Said locking means (160) comprises of at least two reinforcing straps (160),
15 whereby the arrangement is such that said straps (160) travels between the outer wall of said inner sleeve (120) and the inner wall of said outer sleeve (130). One end of said strap (160) passes through a passageway formed between the outer wall of the inner sleeve (120) and the inner wall of the outer sleeve (130), from one of the guiding loop (230) at said top end frame (140) towards one of the
20 corresponding slot (330) at said bottom end cap (150), whereby said corresponding slot (330) is positioned vertically in alignment with said guiding loop (230). This is followed by passing through the slot (330) at the opposite end of the former slot (330) at said bottom end cap (150), thereafter passes through another passageway formed between the outer wall of the inner sleeve (120) and
25 the inner wall of the outer sleeve (130) towards the corresponding guiding loop (230) that is also positioned at the opposite end of the former guiding loop (230). Each of the end of said strap (160) is positioned at the passageway formed between said inner sleeve (120) and said outer sleeve (130) correspondingly so that both end of said strap (160) are tensioned and heat sealed (190) therein
30 respectively, or fastened by any other known fastening means so as to hold both

of said top end frame (140) and bottom end cap (150) in place to the inner sleeve (120) and the outer sleeve (130). Preferably, four straps are used in said octagonal-shaped container whereby two of the straps are parallel to each other and the other two are substantially perpendicular to the first two straps. Thus, using of said locking means (160) which is comprised of at least two straps has secured said top end frame (140) and said bottom end cap (150) to said inner sleeve (120) and said outer sleeve (130). Alternatively, said open top container of the present invention further comprises of at least one reinforcing middle sleeve (170) that is positioned between said inner sleeve (120) and said outer sleeve (130) as shown in FIG. 1-B to strengthen said container when it is in erected position. Said reinforcing middle sleeve (170) is being sandwiched by said inner sleeve (120) and said outer sleeve (130), whereby the side wall (220) of said top end frame (140) is on top of said middle sleeve (170) and the side wall (320) of said bottom end cap (150) is below said middle sleeve (170).

According to the present invention, said open top container may receive a liner (not shown) contained within the inner part of the body of said container. Said liner can be a flexible bag made of a suitable plastic, such as but not limited to polyethylene, polypropylene, or any other polymer materials that may be utilized for receiving of the filled material. Thus, when the material is filled into said container through the open top of said container, said liner will open to fill the contour of said container body. Said liner may be disposable and a new liner is used for subsequent filling and discharging of materials.

Said open top container further comprises of a pallet portion (180) which is moulded into the base portion of said container integrally to said bottom end cap (150). Said pallet portion (180) would enable the tines of a forklift to engage said pallet portion (180) to lift and carry the container. Thus, the user can lift the container easily from the ground and transfer said container to a desired location.

When said open top container is to be disassembled, said top closure (110), said top end frame (140) and said bottom end cap (150) are removed from

said container by cutting said straps (160) which secure said top end frame (140) and said bottom end cap (150) to said inner sleeve (120) and said outer sleeve (130). Said inner sleeve (120) and said outer sleeve (130) are then adapted to be folded into a flat sheet respectively. Said inner sleeve (120) and said outer sleeve
5 (130) can be folded to substantially 2.5 : 1 ratio when said open top container is empty. Said inner sleeve (120) may be separated from said outer sleeve (130). Furthermore, multiple sleeves can be stacked on each other to save the storage space. Thus, by having such an arrangement, the shipping cost for the empty container can be reduced.

10 While the preferred embodiment of the present invention and their advantages have been disclosed in the above Detailed Description, the invention is not limited thereto but only by the scope of the appended claim.

CLAIMS

1. An open top container comprising:

a top closure (110) to cover top portion of said container;

a top end frame (140) of said container;

- 5 a bottom end cap (150) as the closed bottom of said container;

an inner sleeve (120) to define the inner shell of said container; and

an outer sleeve (130) to define the outer shell of said container;

- 10 characterized in that said open top container is a polygonal-shaped foldable container with said inner sleeve (120) being positioned within said outer sleeve (130); wherein each of said inner sleeve (120) and said outer sleeve (130) is formed from one piece of sheet material; wherein said open top container can be easily assembled and disassembled through at least one locking means (160);

- 15 further characterized in that said top end frame (140) comprises of at least a pair of opposing guiding loops (230) and said bottom end cap (150) comprises of at least a pair of opposing slots (330) for receiving said locking means (160).

2. An open top container as claimed in Claim 1 wherein said locking means (160) comprises of at least one reinforcing strap that travels between the
20 outer wall of said inner sleeve (120) and the inner wall of said outer sleeve (130) through said pair of opposing guiding loops (230) at said top end frame (140) and said pair of its corresponding opposing slots (330) at said bottom end cap (150); wherein one end of said strap (160) is positioned at the passageway formed between said inner sleeve (120) and said outer

sleeve (130) while the other end of said strap (160) is positioned at the opposing passageway; both ends of said strap (160) are tensioned and heat sealed (190) therein respectively.

3. An open top container as claimed in Claim 2 wherein both ends of said
5 strap (160) can be fastened by any other known fastening means so that both of said top end frame (140) and bottom end cap (150) are held in place to said inner sleeve (120) and said outer sleeve (130).
4. An open top container as claimed in Claim 1 or Claim 2 wherein said
10 container further comprises of at least one reinforcing middle sleeve (170) that is positioned between said inner sleeve (120) and said outer sleeve (130) to strengthen said container when said container is in erected position.
5. An open top container as claimed in Claim 1 or Claim 2 wherein said
15 bottom end cap (150) comprises of a substantially planar surface (340) and a side wall (320) that is circumferential on said planar surface (340) and extended substantially perpendicular from said planar surface (340) to a predefined height; wherein a lip (310) is formed around the edge of said bottom end cap (150); wherein said at least a pair of slots (330) is
20 positioned between said lip (310) and the exterior side wall (320) of said bottom end cap (150).

6. An open top container as claimed in Claim 1 or Claim 2 wherein said top end frame (140) comprises of an open center (240) and a side wall (220) that is circumferential on said top end frame (140) and extended substantially perpendicular from said top end frame (140) to a predefined height; wherein a lip (210) is formed around the edge of said top end frame (140); wherein said at least a pair of guiding loops (230) is positioned between said lip (210) and the exterior side wall (220) of said top end frame (140).
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7. An open top container as claimed in Claim 1 or Claim 2 wherein the positioning of said guiding loop (230) at said top end frame (140) is vertically in alignment with its corresponding slot (330) at said bottom end cap (150).
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8. An open top container as claimed in Claim 6 wherein said top end frame (140) is positioned on the upper end of said inner sleeve (120) and said outer sleeve (130); wherein the side wall (220) of said top end frame (140) is being inserted into the upper portion of the gap between said inner sleeve (120) and said outer sleeve (130).
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9. An open top container as claimed in Claim 5 wherein said bottom end cap (150) is positioned at the lower end of said inner sleeve (120) and said outer sleeve (130); wherein the side wall (320) of said bottom end cap (150) is being inserted into the lower portion of the gap between said inner sleeve (120) and said outer sleeve (130).
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10. An open top container as claimed in Claim 1 or Claim 2 wherein said top closure (110) can be connected to said top end frame (140) by fastening at least one edge of said top closure (110) to one edge of said top end frame
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(140) by using fastening means through at least one receiving hole at said top end frame (140).

11. An open top container as claimed in Claim 1 or Claim 2 wherein said container is an octagonal-shaped container; wherein each of said inner sleeve (120) and said outer sleeve (130) is provided with eight sidewall panels.
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12. An open top container as claimed in Claim 1 or Claim 2 wherein said container further comprises of at least one liner that is contained within the inner part of the body of said container for receiving of the filled material.
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13. An open top container as claimed in Claim 1 or Claim 2 wherein said container further comprises of a pallet portion (180) which is attached at the base portion of said container through said bottom end cap (150) to enable said container to be easily transferred.
14. An open top container as claimed in Claim 2 wherein if said open top container is to be disassembled, said top closure (110), said top end frame (140) and said bottom end cap (150) are removed from said container by cutting said straps (160) which is used to secure said top end frame (140) and said bottom end cap (150) to said inner sleeve (120) and said outer sleeve (130).
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15. A method of assembling an open top container comprising steps of:

assembling and folding an inner sleeve (120) and an outer sleeve (130) through their respective scored lines to form a shape of container body;

placing said inner sleeve (120) within the interior side of said outer sleeve (130) to form the inner shell and the outer shell of said container;

placing a top end frame (140) on the upper end of said inner sleeve (120) and said outer sleeve (130) and placing a bottom end cap (150) at the lower end of said inner sleeve (120) and said outer sleeve (130); wherein said top end frame (140) comprises of at least a pair of opposing guiding loops (230) and said bottom end cap (150) comprises of at least a pair of opposing slots (330); and

placing at least two locking means (160) to hold said top end frame (140) and said bottom end cap (150) in place to said inner sleeve (120) and said outer sleeve (130); wherein said locking means (160) comprises of at least two reinforcing strap (160) that travels between the outer wall of said inner sleeve (120) and the inner wall of said outer sleeve (130) through said pair of opposing guiding loops (230) at said top end frame (140) and said pair of its corresponding opposing slots (330) at said bottom end cap (150); wherein one end of said strap (160) is positioned at the passageway formed between said inner sleeve (120) and said outer sleeve (130) while the other end of said strap (160) is positioned at the opposing passageway; both end of said strap (160) are tensioned and heat sealed (190) therein respectively.

16. A method of assembling an open top container as claimed in Claim 15 further comprising step of placing at least one reinforcing middle sleeve (170) between said inner sleeve (120) and said outer sleeve (130) before said step of placing a top end frame (140) on the upper end and placing a bottom end cap (150) at the lower end of said inner sleeve (120) and said outer sleeve (130) to strengthen said container when said container is in erected position.

17. A method of assembling an open top container as claimed in Claim 15 further comprising step of placing a removable top closure (110) to said container; wherein said top closure (110) can be connected to said top end frame (140) at any stage by fastening at least one edge of said top closure (110) to one edge of said top end frame (140) by using fastening means.
18. A method of assembling an open top container as claimed in Claim 15 wherein said container can be disassembled by following steps:
- cutting said straps (160) which secures said top end frame (140) and said bottom end cap (150) to said inner sleeve (120) and said outer sleeve (130);
- removing said top end frame (140) and said bottom end cap (150) from said container; and
- folding said inner sleeve (120) and said outer sleeve (130) into a flat sheet respectively.