

## BULK PACKAGING ASSEMBLY

### Field of the Invention

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The invention relates to the packaging of materials and/or goods, generally referred to as bulk packaging, for transportation and/or storage. Said packaging may be required for shipping within a shipping container or transport by truck. In particular, the invention relates to an assembly of members forming a bulk packaging assembly.

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### Background

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Traditionally, bulk packaging relies upon placing the material/goods on a wooden, steel or plastic palette and securing said materials by strapping and/or plastic wrap in order to secure the material to the palette. The weight of the palette is typically high and the protection of the bulk packaging is subject to whatever cover is provided by the plastic wrap. Further, whilst the palette may be recyclable, no other part of the packaging is and so wastage of single use materials is significant.

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Other bulk packaging systems are available having timber or molded plastic boxes mounted to support palettes. Whilst these may be reusable, they are considerably heavier than the single use material option. Further, as any reusable system will have a finite life, the replacement cost of the replaceable elements may still represent a substantial capital investment. Further, in the case of damage the substantial capital

investment for the packaging may be lost after becoming unusable well before the economic life.

### Summary of Invention

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In a first aspect the invention provides a bulk packaging assembly for the transport and storage of freight comprising: a base having a support face upon which the assembly is supported; a cover having an upper face and; at least one panel extending between the base and cover, said at least one panel forming walls of said assembly such that said  
10 base, cover and at least one panel defining a storage void; wherein the support face and upper face are profiled so as to permit engagement between the support face and an upper face of a second bulk packaging assembly upon which the assembly is placed.

In a second aspect the invention provides a method of constructing bulk packaging  
15 assembly comprising the steps of: providing a base; positioning walls adjacent to a peripheral edge of said base; inserting webbing spanning within a void defined by said walls, and placing a cover on a top edge of said walls.

In a third aspect the invention provides a bulk packaging assembly for the transport and  
20 storage of freight comprising: a base having a support face upon which the assembly is supported; a cover having an upper face; said base and cover, defining a storage void whereby the cover is placed directly on said freight; wherein the support face and upper face are profiled so as to permit engagement between the support face and an upper face of a second bulk packaging assembly upon which the assembly is placed.

The invention therefore comprises a three-part construction of a base, a cover and at least one panel, with said base and cover being profiled to be inter-engageable. The base and cover may be formed of molded plastic or other construction, and shaped so as to provide for the inter-engageability.

The at least one panel is placed intermediate the base and cover, and may be a plurality of panels joined together, each panel representing a single wall. Alternatively, a single panel may form two, three or all four walls. In the case of the said at least one panel forming all four walls, said panel may be of a tube construction so as to extend between the base and cover, with said base and cover encapsulating opposing ends of the tube.

The panels may be of relatively light construction, and may be required to carry an axial load between the base and cover to promote stacking of multiple assemblies. In one embodiment, the panel may be a sandwich construction of polypropylene having a cross-sectional area sufficient to transfer load through the panels from the cover to the base. This construction may be sufficient to permit several assemblies according to the present invention to be stacked upon each other. As such, the panel, when assembled with the cover and base may support a substantial compressive load. Further, in one embodiment whereby the panel is of a plastic material, such as HDPE or PP, the compressive strength of the panel may be substantially unaffected by moisture and weather whilst still maintaining the compressive strength.

The panel cross-section may be further reduced if buckling of the panel may be prevented by internal support of the walls, through spanning a member or series of members between opposed walls of said panel. Such a plurality of members may be webbing, in the form of a chequer board arrangement of members. Thus, when the panel

5 is of rectangular prismatic shape and having webbing in a chequer board arrangement, the axial load through stacking may be passed through the panels and buckling of the panels prevented by said webbing.

In a further advantage, the webbing in the chequer board arrangement may provide for

10 internal packaging so as to provide storage space within each void of the chequer board. For instance, elongate goods such as bottles may be stacked between the chequer board and so the structural integrity of the assembly and in particular the panel may be provided through the preferred means of storing the transportable material.

15 The webbing may be of the same material and thickness as the panel. In this embodiment, the webbing may also provide axial load bearing capacity to assist in the maximum capacity for stacking of the assemblies. Alternatively, the webbing may be of much lighter construction appropriate for low cost internal packaging and serve as a support to the walls/panels only.

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The base and/or cover may be of molded plastic such as injection-molded or blow-molded construction from HDPE or PP. The inter-engageability may be provided by projections from the respective support or upper faces and arranged such that the projections inter-engage or nest so as to permit stacking. The projections may further

be load bearing portions which transmit the load from the support face to the upper face of a second assembly beneath the first assembly. Further still, the projections may also prevent lateral relative movement of the assemblies, and so preventing stacked assemblies from sliding off during transportation. This added lateral stability, together  
5 with the load bearing capacity, may further assist in allowing multiple stacked assemblies, in that higher stacks may be transportable due to the inter-engagement.

In a further embodiment, the projections may have inclined faces such that as an assembly is placed upon another, the inclined faces of said projections contact, and self  
10 -align the assemblies into the correct position for inter-engagement.

In a further embodiment, the base and cover may be of identical construction and shape so as to be interchangeable. This has the advantage of relying upon only one injection mold, or blow mold, die for the construction of the base and cover and so reducing the  
15 capital cost in construction of the assembly.

The assembly may be disassembled with the panels resiliently collapsed into a flat shape so as to facilitate the storage and/or transport of the bulk packaging assembly when not in use. The panels may then be re-formed with the assembly reassembled  
20 when required. Thus, further cost advantages may be achieved in being able to deliver empty packaging in an efficient and costs effective manner back to the point of origin ready for reuse.

Because the panel may be of a light and relatively low cost material, damage to said panel may lead to a low cost replacement with the more expensive components of the assembly being the base and cover reusable with a replacement panel section.

- 5 The cover and/or base may further include a peripheral edge projecting at right angles to the respective support and/or top face, such that the panel may fit within said peripheral edges and so encapsulating, protecting and supporting the opposed ends of said panel against localized damage and buckling. By having a peripheral edge around the end of the panel, that end may be further supported against buckling in a high load situation.
- 10 Further, it may permit water, such as rain, applied to the top of the assembly to flow around the panel and not flow into the storage space/void within the assembly.

The cover may be shaped so as to channel applied water away from the panels to further prevent the flow of water into the storage void.

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- The panels may be formed of a variety of materials, for instance, polypropylene or polyethylene or other material suitable for any one or a combination of: low cost, resilient, water resistant and axial load bearing capacity. The base and cover may also be plastic and may also be polypropylene or polyethylene or ABS, or other appropriate
- 20 material suitable for any one or a combination of: longevity, abrasion resistance and impact resistance.

In one embodiment, the invention may comprise identical base and cover of a relatively hard plastic such as HDPE. The base and cover may be separated by a wall comprising

a continuous panel. The panel may be an extruded plastic, such as polypropylene, and may be of a fluted arrangement. The panel may be capable of substantial compressive strength so as to support load placed on the assembly. Further, the assembly comprising the base, cover and wall may be selectively disassembled. In the disassembled arrangement, the panel may be rolled up and laid flat. Further, the base and cover may be shaped so as to nest, that is fit one inside the other to reduce the overall volume.

The base may be further shaped to receive fork-lift tines so as to further facilitate the movement of the packaging into a stack formation with other assemblies.

The dimensions of said assembly may be a multiple of a larger containment device for intermodal transportation. For instance, a standard 20 foot shipping container may have standard dimensions of 20 feet in length, 8 feet in width and 8 feet 6 inches in height. To this end, each assembly may be cubic having each side of 4 feet, and thus allow 20 assemblies to fit within a 20 foot container. In so doing, the assembly may be sized so as to maximize the available space in a standard 20 foot container. It will be appreciated that a similar approach may be taken for other standard sized containers, such as a 40 foot container.

## Brief Description of Drawings

It will be convenient to further describe the present invention with respect to the accompanying drawings that illustrate possible arrangements of the invention. Other arrangements of the invention are possible and consequently, the particularity of the

accompanying drawings is not to be understood as superseding the generality of the preceding description of the invention.

Figures 1A and 1B are various isometric views of a packaging assembly according to one embodiment of the present invention;

Figure 2 is an isometric view of a plurality of bulk packaging assemblies stacked according to a further embodiment of the present invention;

Figures 3A to 3F are sequential views of a method of construction of the bulk packaging assembly according to one embodiment of the present invention.

#### Detailed Description

Figures 1A and 1B show a bulk packaging assembly 5 according to one embodiment of the present invention. Here, a base 15 and cover 10 are separated by a panel 20 which form a substantially cubic shape which define a storage void 51 for the transport and storage of freight or other materials may be transported by the assembly 5. The panel 20 forms a tube, in this case a rectangular prismatic tube which fits within projecting peripheral edges 40, 45 of the cover 10 and base 15.

One panel comprises a single sheet 20 of polypropylene in a sandwich construction form which is wrapped into a square shape forming three sides with the panel completed

with a final panel 60 forming the forming the fourth side. It will be appreciated that the panel may comprise several pieces or a single piece bent to the appropriate shape.

In this embodiment, the base 15 and cover 10 are identical and in fact may be  
5 interchangeable for efficient manufacturing as well as providing replacement parts in case of damage. As shown in Figure 1B, the cover 10 includes projections 35 projecting from the upper face 30. In this embodiment, not only do the projections 35 permit a matching engagement with projections corresponding to a base of a second assembly (not shown), but are also of sufficient size to transmit the axial load through  
10 the cover to the panels. The panels, in this case, transmit an axial load to the base and consequently to the ground or to an assembly located beneath. Because the panels 20 may be of thin construction so as to reduce material costs, whilst being able to transmit the axial load may be subject to buckling. To prevent this in this embodiment, internal webbing 52 is located within the storage void 51 so as to support the walls of the panel  
15 against buckling. The webbing 52 further allows for the placement of elongate materials 54 within the voids created by the webbing 52. And so the webbing 52 has the dual function of supporting the panels/walls against buckling and so reducing the cost of the panel as well as providing an efficient mean by which materials may be stored and transported within the bulk packaging assembly 5. In one embodiment, the  
20 panel may support in the range 850kg to 1200 kg and may be able to stack up to 7 assemblies upon each other.

Figure 2 shows an example of the use of the bulk packaging assembly 5 in a stack arrangement 70.

Here, it can be seen that a base 80 inter-engages 65 with a cover 85 of an assembly located beneath the first assembly. The projecting members are positioned within the base and cover so as to allow an engagement which prevents sideways movement but  
5 also permits the transmission of an axial load through the projection from the base 80 to the cover 85.

Figures 3A to 3F show a sequential view of the construction of a bulk packaging assembly according to the present invention.

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The process starts with a base 90 being placed on the ground. Walls 95 are then fitted to the base adjacent to a peripheral edge of the base 90. In this case, the peripheral edge includes a projecting edge directed upwards. The walls 95 then fit within the projecting edge 92 of the base 90. In this embodiment, to assist with positioning, the walls also  
15 have a section of webbing 100 already attached to provide stability until construction is complete.

Once the walls 95 are placed, further webbing 105 is positioned within the void defined by the walls 95. Figure 3E shows a view of the webbing 110 having being completed.

20 The walls and base have been removed for clarity. Figure 3F shows the completed process having a cover fitted to the top edge of the walls, in this case having a similar projecting edge 120 which is directed downwards so as to keep the walls in place.

Claims

1. A bulk packaging assembly for the transport and storage of freight comprising  
5 a base having a support face upon which the assembly is supported;  
a cover having an upper face and;  
at least one panel extending between the base and cover, said at least one  
panel forming walls of said assembly such that said base, cover and at least  
one panel defining a storage void;  
10 wherein the support face and upper face are profiled so as to permit  
engagement between the support face and an upper face of a second bulk  
packaging assembly upon which the assembly is placed.
2. The bulk package assembly according to claim 1 wherein the cover and/or  
15 base include peripheral edges projecting at right angles to the corresponding  
support and/or upper face, said at least one panel fitting within said  
projecting edges so as to encapsulate said opposed ends of said at least one  
panel.
- 20 3. The bulk packaging assembly according to claim 2 wherein said cover and  
peripheral edges are arranged to channel water away from said at least one  
panel.

4. The bulk packaging assembly according to any one of the preceding claims wherein the support and upper faces include inter-engaging projections placed to co-operatively engage said support and upper face.
- 5 5. The bulk packaging assembly according to any one of the preceding claims where the at least one panel comprises at least one elongate member having a bend formed therein such that the at least one panel provides a plurality of walls, said bend forming a corner of said packaging assembly.
- 10 6. The bulk packaging assembly according to any one of the preceding claims wherein the cover and base are identical.
7. The bulk packaging assembly according to any one of the preceding claims wherein said base is shaped to receive fork-lift tines.
- 15 8. The bulk packaging assembly according to any one of the preceding claims further including webbing within said storage void, said webbing engaged with said walls so as to prevent buckling of the said walls on application of an axial load to said at least one panel.
- 20 9. A method of constructing bulk packaging assembly comprising the steps of:  
providing a base;  
positioning walls adjacent to a peripheral edge of said base;  
inserting webbing spanning within a void defined by said walls, and

placing a cover on a top edge of said walls.

10. A bulk packaging assembly for the transport and storage of freight comprising

5 a base having a support face upon which the assembly is supported;  
a cover having an upper face;  
said base and cover, defining a storage void whereby the cover is placed  
directly on said freight;  
wherein the support face and upper face are profiled so as to permit  
10 engagement between the support face and an upper face of a second bulk  
packaging assembly upon which the assembly is placed.

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