

A PALLET ASSEMBLY

Field of Invention

The present invention relates generally to a pallet assembly and components for construction thereof. The pallet assembly constitutes the XPallet™ product line of handling and storage products.

Background

Pallets have been used for many years to provide portable platforms for handling, storing, or moving articles and packages, such as in warehouses or vehicles. Typically, the platform consists of multiple top slats mounted on transverse support elements that elevate the slats from the ground and allow handling of the pallet with forklift equipment. Bottom slats may also be used to reinforce the structure and/or provide a continuous surface for supporting the pallet on a conveyor.

Weight, cost, structural strength, versatility of use, ease of transport, and ability to re-use are all important factors in the evaluation of the ideal pallet for a particular application. Accordingly, the prior art is rich in designs developed for optimal performance for specific uses. It would be desirable to have a pallet of modular construction that provided multiple configurations for different uses and that could be disassembled into basic components. Therefore, there is an apparent need for an improved approach for addressing the foregoing problems.

Summary

In accordance with a first aspect of the invention, there is disclosed a pallet assembly comprising a stringer board and a deck board. The deck board comprises a first elongated side panel, a second elongated side panel, and a bridge coupling the first elongated side board to the second elongated side board. The bridge is dimensioned for interspacing and defining a groove between the first elongated side board and the second elongated. Each of the first elongated side board and the second elongated side board defines a duct extending along the length thereof and comprising an inner webbing and an outer webbing extending along the length thereof. The inner webbing is formed proximal the groove and the outer webbing

being formed distal the groove. The deck board is couplable to the stringer board with the first elongated side panel and the second elongated side panel abutting therewith, and the bridge interposing the groove and the stringer board. The groove is for receiving at least one fastening means for fastening the bridge to the stringer board.

In accordance with a second aspect of the invention, there is disclosed a deck board comprising a first elongated side panel, a second elongated side panel, and a bridge coupling the first elongated side board to the second elongated side board. The bridge is dimensioned for interspacing and defining a groove between the first elongated side board and the second elongated. Each of the first elongated side board and the second elongated side board defines a duct extending along the length thereof and comprising a inner webbing and an outer webbing extending along the length thereof. The inner webbing is formed proximal the groove and the outer webbing being formed distal the groove. The deck board is couplable to a stringer board with the first elongated side panel and the second elongated side panel abutting therewith, and the bridge interposing the groove and the stringer board. The groove is for receiving at least one fastening means for fastening the bridge to the stringer board.

Brief Description of the Drawings

FIG. 1 shows a perspective view of a pallet assembly comprising a stringer board and a deck board coupled with the stringer board in accordance with an aspect of the invention;

FIG. 2 shows a perspective view of the deck board of FIG. 1;

FIG. 3 shows an end elevation of the deck board of FIG. 2;

FIG. 4 shows a perspective view of the stringer board of FIG. 1;

FIG. 5 shows an end elevation of the stringer board of FIG. 4;

FIG. 6 shows a partial view along View B of Portion A of the pallet assembly of FIG. 1; and

FIG. 7 shows a partial plan view of Portion A of the pallet assembly of FIG. 1.

FIG. 8 shows an end elevation of the stringer board of FIG. 5 being formed as a stringer beam;

FIG. 9 shows a partial perspective view of the stringer beam of FIG. 8 being formed as stringer blocks arranged in a four-blocks configuration;

FIG. 10 shows a partial perspective view of the stringer beam of FIG. 8 being formed as stringer blocks arranged in a six-blocks configuration;

FIG. 11 shows a partial perspective view of the stringer beam of FIG. 8 being formed as stringer blocks arranged in a nine-blocks configuration; and

FIG. 12 shows a partial perspective view of the stringer blocks of FIG. 11 being assembled in the pallet assembly of FIG. 1.

Detailed Description

Reference will now be made in detail to an exemplary embodiment of the present invention, examples of which are illustrated in the accompanying drawings. While the invention will be described in conjunction with the embodiment, it will be understood that they are not intended to limit the invention to these embodiments. On the contrary, the invention is intended to cover alternatives, modifications and equivalents, which may be included within the spirit and scope of the invention as defined by the appended claims. Furthermore, in the following detailed description of embodiments of the present invention, numerous specific details are set forth in order to provide a thorough understanding of the present invention. However, it will be recognized by one of ordinary skill in the art that the present invention may be practiced without these specific details. In other instances, well-known methods, procedures, components, and circuits have not been described in detail as not to unnecessarily obscure aspects of the embodiments of the present invention

An exemplary embodiment of the invention, a pallet assembly 20, is described with reference to FIGS 1 to 12. The pallet assembly 20 is preferably used for supporting articles. Preferably, the pallet assembly 20 is a transport structure for supporting articles in a stable manner while being transported by a jacking device, for example, by a pallet jack or a forklift. The pallet assembly constitutes the XPallet™ product line of handling and storage products.

Preferably, the pallet assembly 20 comprises a stringer board 22 and a deck board 24 inter-coupled to form a flat support structure. During implementation, multiple pieces of the stringer board 22 may be used in conjunction with multiple pieces of the deck board 24 to adapt to the size, dimension and needs of the article being supported by the pallet assembly 20.

Preferably, the deck board 24 comprises a first elongated side panel 26, a second elongated side panel 28 and a bridge 30 coupling the first elongated side board 26 to the second elongated side board 28. The bridge 30 is dimensioned for interspacing and defining a groove 32 between the first elongated side board 26 and the second elongated 28.

Each of the first elongated side board 26 and the second elongated side board 28 defines a duct 34a/34b extending along the length thereof and comprises an inner webbing 36a/36b and an outer webbing 38a/38b also extending along the length thereof. Preferably, each of the first elongated side board 26 and the second elongated side board 28 are substantially rectilinear in shape. The inner webbing 36a/36b of each of the first elongated side board 26 and the second elongated side board 28 being formed proximal the groove 32 while the outer webbing 38a/38b of each of the first elongated side board 26 and the second elongated side board 28 is formed distal the groove 32. The inner webbing 36a/36b and the outer webbing 38a/38b of each of the first elongated side board 26 and the second elongated side board 28 are preferably substantially equally spaced within the respective duct 34a/34b thereof. Having the outer webbing 38a/38b in addition to the inner webbing 36a/36b for each of the first elongated side board 26 and the second elongated side board 28 improves load-bearing stability of the deck board 24 when in use.

The deck board 24 is couplable to the stringer board 22 with the first elongated side panel 26 and the second elongated side panel 28 abutting therewith. When the deck board 24 is coupled to the stringer board 22, the bridge 30 interposes the groove 32 and the stringer board 22 with the groove 32 for receiving at least one fastening means 40 for fastening the bridge 30 of the deck board 24 to the stringer board 22. As the bridge 30 preferably extends substantially the length of the deck board 24, the quantity of and positioning of the at least one fastening means 40 can vary widely. Further, the bridge 30 enables the deck board 24 to be removably couplable to the stringer board 22 and be reused.

For each of the first elongated side panel 26 and the second elongated side panel 28, the inner webbing 36a/36b and the outer webbing 38a/38b are inter-configured within the respective duct 34a/34b for forming channels 42a/42b/42c in the first elongated side panel 26 and channels 44a/44b/44c in the second elongated side panel 28. Preferably, three channels 42a/42b/42c are formed in the first elongated side panel 26 while three channels 44a/44b/44c are formed in the second elongated side panel 28. Further, the three channels 42a/42b/42c formed in the first elongated side panel 26 and the three channels 44a/44b/44c formed in the second elongated side panel 28 are preferably similarly shaped and dimensioned.

Alternatively, more than three channels may be formed with just the inner webbing 36a/36b and the outer webbing 38a/38b or with webbings added to the inner webbing 36a/36b and the outer webbing 38a/38b.

It is further preferred that each of the three channels 42a/42b/42c formed in the first elongated side panel 26 and each of the three channels 44a/44b/44c formed in the second elongated side panel 28 has rectangular cross-sections. It is further preferred that the rectangular cross-sections of each of the three channels 42a/42b/42c formed in the first elongated side panel 26 and each of the three channels 44a/44b/44c formed in the second elongated side panel 28 has a width-to-height ratio that ranges from 1.5:1 to 0.75:1.

Each of the first elongated side panel 26 and the second elongated side panel 28 defines a first support face 62a/62b. The first support face 62a of the first elongated side panel 26 and the first support face 62b of the second elongated side panel 28 extends substantially along a first plane 64 and are for abutting with the stringer board 22 when the stringer board 22 couples with the deck board 24. Further, each of the first elongated side panel 26 and the second elongated side panel 28 defines a second support face 66a/66b outwardly opposing the respective first support face 62a/62b. Preferably, the second support face 66a/66b extends substantially parallel the first support face 62a/62b for supporting at least one article thereon.

Further, the bridge 30 also preferably extends substantially parallel the first plane. Although it is not required for the bridge 30 to be formed along the first plane 64, it is preferred that the bridge 30 extends adjacent the first plane 64. Therefore when in use, the at least one fastening means 40 can be applied to passage initially through the bridge 30 and subsequently through the stringer board 22 for anchoring the bridge 30, and consequently the deck board 24, to the stringer board 22. The at least one fastening means 40 is at least one of a screw fastener, a stapler fastener and a rivet.

Preferably, the stringer board 22 comprises a top face 72 and a bottom face 74 outwardly facing the top face 72. The stringer board 22 defines a duct 76 extending along the length

thereof between the top face 72 and the bottom face 74. The stringer board 22 further comprises an upper webbing 78 and a lower webbing 80 extending along the length of the duct 76 thereof. The upper webbing 78 is formed proximal the top face 72 while the lower webbing 80 is formed proximal the bottom face 74 of the stringer board 22. Preferably, the top face 72 of the stringer board 22 substantially abuts the first support face 62a/62b of each of the first elongated side panel 26 and the second elongated side panel 28 when the stringer board 22 is coupled with the deck board 24.

Preferably, the distance between the bottom face 74 and the lower webbing 80 is similar to the distance between the top face 72 and the upper webbing 78. Alternatively, the distance between the bottom face 74 and the lower webbing 80 is greater than the distance between the top face 72 and the upper webbing 78. Preferably, the distance between the bottom face 74 and the lower webbing 80 is twice the distance between the top face 72 and the upper webbing 78.

Further alternatively, the stringer board 22 further comprises a centre webbing 82 formed between the upper webbing 78 and the lower webbing 80, with the centre webbing 82, upper webbing 78 and the lower webbing 80 being equally spaced within the duct 76 of the stringer board 22.

When coupling the stringer board 24 to the deck board 22 using the fasteners 40, the fasteners may extend into the stringer board 24 and through the upper webbing 78 towards the lower webbing 80. However, it is presented that the fasteners 40 may further extend through the centre webbing 82 and upper webbing 78. Alternatively, the fasteners may be further elongated to extend through the upper webbing 78, centre webbing 82 and the lower webbing 80. It is preferred that one or both of the stringer board 22 and the deck board 24 is formed from plastic.

A pair of the stringer board 22 can be inter-coupled to form a stringer beam 100. In the stringer beam 100, sidewalls 102 of the pair of the stringer boards 22 inter-abut to enable inter-coupling via the sidewalls 102, preferably using one or more fasteners 104. The stringer beam 100 can then be coupled to the deck board 24 in the pallet assembly 20.

Further, the elongated stringer beam 100 can be shortened to form a stringer block 106. When formed as the stringer block 106, multiple pieces of the stringer blocks are preferably utilised and arranged in configurations that enables distributed load-bearing on both the multiple stringer blocks 106 and a row of the deck boards 24 the multiple stringer blocks 106 support. The stringer blocks 106 may take on a four-blocks configuration 110, a six-blocks configuration 112 or a nine-blocks configuration 114. When formed as the stringer blocks 106, the stringer blocks are sandwiched between a pair of the support panels 200 to form vertical sub-modules 202. A plurality of the elongated vertical sub-modules 202 are then arranged in rows and spaced apart to enable a plurality of the deck boards 24 to be arranged substantially perpendicular the elongated vertical sub-modules 202 for coupling thereto to form the pallet assembly 20. Each of the support panels 200 can be formed as a flat planar sheet or an elongated board and can be made from a variety of materials including plastic and wood. The support panels 200 are coupled to the stringer blocks 106 using fasteners or adhesive means. In addition or alternatively, each of the support panels 200 may be shaped similar to the deck board 24.

In a forgoing manner, a pallet assembly is described according to an exemplary embodiment of the invention. Although only one embodiment of the invention is disclosed in this document, it will be apparent to one skilled in the art in view of this disclosure that numerous changes and/or modifications can be made to the disclosed embodiment without departing from the scope and spirit of the invention.

Claims

1. A pallet assembly comprising:
 - a stringer board; and
 - a deck board comprising:
 - a first elongated side panel;
 - a second elongated side panel; and
 - a bridge coupling the first elongated side board to the second elongated side board, the bridge being dimensioned for interspacing and defining a groove between the first elongated side board and the second elongated, each of the first elongated side board and the second elongated side board defining a duct extending along the length thereof and comprising a inner webbing and an outer webbing extending along the length thereof, the inner webbing being formed proximal the groove and the outer webbing being formed distal the groove,

wherein the deck board is couplable to the stringer board with the first elongated side panel and the second elongated side panel abutting therewith, and the bridge interposing the groove and the stringer board, the groove for receiving at least one fastening means for fastening the bridge to the stringer board.
2. The pallet assembly as in claim 1, the inner webbing, the outer webbing and the duct of each of the first elongated side panel and the second elongated side panel being inter-configured for forming at least three channels in each of the first elongated side panel and the second elongated side panel.
3. The pallet assembly as in claim 2, the at least three channels of each of the first elongated side panel and the second elongated side panel being substantially similarly shaped and dimensioned.
4. The pallet assembly as in claim 1, each of the first elongated side panel and the second elongated side panel having a first support face extending along a first plane for abutting with the stringer board.

5. The pallet assembly as in claim 4, each of the first elongated side panel and the second elongated side panel having a second support face extending substantially parallel the first plane for supporting at least one article thereon.
6. The pallet assembly as in claim 4, the bridge being substantially parallel the first plane.
7. The pallet assembly as in claim 1, the at least one fastening means for passing initially through the bridge and subsequently through the stringer board for anchoring the bridge to the stringer board.
8. The pallet assembly as in claim 7, the at least one fastening means being at least one of a screw fastener, a stapler fastener and a rivet.
9. The pallet assembly as in claim 1, at least one of the stringer board and the deck board is formed from plastic.
10. The pallet assembly as in claim 1, the stringer board defining a duct extending along the length thereof and comprising:
 - a top face;
 - a bottom face outwardly facing the top face;
 - an upper webbing and a lower webbing extending along the length of the duct, the upper webbing being formed proximal the top face and the lower webbing being formed proximal the bottom face,
 - wherein the top face substantially abuts the first elongated side panel and the second elongated side panel when the stringer board is coupled with the deck board.
11. The pallet assembly as in claim 10, the distance between the bottom face and the lower webbing being greater than the distance between the top face and the upper webbing.

12. A deck board comprising:
 - a first elongated side panel;
 - a second elongated side panel; and
 - a bridge coupling the first elongated side board to the second elongated side board, the bridge being dimensioned for interspacing and defining a groove between the first elongated side board and the second elongated,
 - each of the first elongated side board and the second elongated side board defining a duct extending along the length thereof and comprising a inner webbing and an outer webbing extending along the length thereof, the inner webbing being formed proximal the groove and the outer webbing being formed distal the groove,
 - wherein the deck board is couplable to a stringer board with the first elongated side panel and the second elongated side panel abutting therewith, and the bridge interposing the groove and the stringer board, the groove for receiving at least one fastening means for fastening the bridge to the stringer board.
13. The deck board as in claim 12, the inner webbing, the outer webbing and the duct of each of the first elongated side panel and the second elongated side panel being inter-configured for forming at least three channels in each of the first elongated side panel and the second elongated side panel.
14. The deck board as in claim 13, the at least three channels of each of the first elongated side panel and the second elongated side panel being substantially similarly shaped and dimensioned.
15. The deck board as in claim 12, each of the first elongated side panel and the second elongated side panel having a first support face extending along a first plane for abutting with the stringer board.
16. The deck board as in claim 15, each of the first elongated side panel and the second elongated side panel having a second support face extending substantially parallel the first plane for supporting at least one article thereon.

17. The deck board as in claim 15, the bridge being substantially parallel the first plane.
18. The deck board as in claim 12, the at least one fastening means for passaging initially through the bridge and subsequently through the stringer board for anchoring the bridge to the stringer board.
19. The deck board as in claim 18, the at least one fastening means being at least one of a screw fastener, a stapler fastener and a rivet.
20. The deck board as in claim 12, the first elongated side panel, the second elongated side panel and the bridge being formed from plastic.