A plastic twin sheet pallet and a method of forming the pallet. The pallet includes an upper plastic sheet and a lower plastic sheet selectively fused together to form a generally rectangular pallet having an upper platform structure. The pallet further includes a metallic support structure positioned beneath the platform structure between the upper and lower sheets and including a plurality of beam members arranged end to end in a rectangular frame configuration with each beam member generally parallel to and spaced inboard from the respective outer edge of the pallet. The pallet further includes a peripheral groove structure opening upwardly in the platform structure between each beam member and the respective outer edge of the pallet. The pallet defines a peripheral groove structure opening upwardly in the platform structure between each beam member and their respective outer edge of the pallet. With the lower sheet in a heated state the beam members are positioned in upwardly opening channels defined in the lower sheet with beveled ends of the beam members positioned end to end but in spaced relation, whereafter a thermoformed upper sheet is fused to the lower sheet to encapsulate the beam members between the sheets. As theresulting pallet cools and shrinks the end to end and side to side shrinkage of the pallet brings the beveled ends of the beam members together to form a continuous rectangular frame configuration firmly imbedded within the pallet. The pallet further includes reinforcing rods embedded in rectangular configuration in the lower footprint face of the pallet to augment the reinforcing action of the beam members.
RACKABLE TWIN SHEET PALLET

BACKGROUND OF THE INVENTION

[0001] This invention relates to shipping and storage pallets and more particularly to plastic pallets embodying a twin sheet construction.

[0002] Whereas twin sheet plastic pallets have in general proven to be superior to the wooden pallets previously in use, prior art twin sheet pallets have tended to creep or sag after extended periods of use especially when utilized in a raked manner with opposite edges of the pallet supported by spaced bars of a rack structure.

SUMMARY OF THE INVENTION

[0003] This invention is directed to the provision of an improved twin sheet pallet.

[0004] More specifically, this invention is directed to the provision of a twin sheet plastic pallet which is resistant to creeping or sag even after extended periods of usage in a raked environment.

[0005] Yet more specifically, this invention is directed to the provision of a twin sheet plastic pallet that is rackable in both directions, either side to side or end to end.

[0006] The invention pallet is of the plastic twin sheet type comprising an upper plastic sheet and a lower plastic sheet selectibly fused together to form a generally rectangular pallet having an upper platform structure.

[0007] According to an important feature of the invention, the pallet further includes a metallic support structure positioned beneath the platform structure between the upper and lower sheets and including a plurality of beam members arranged end to end in a rectangular frame configuration with each beam member generally parallel to a respective outer edge of the pallet.

[0008] According to a further feature of the invention, each beam member is spaced inboard with respect to the respective outer edge.
According to a further feature of the invention, the pallet defines a groove structure opening upwardly in the platform structure between each beam member and the respective outer edge.

According to a further feature of the invention, each groove structure is formed by portions of the upper sheet fused to portions of the lower sheet and the portions of the lower sheet forming the groove structures comprise a continuous upwardly opening peripheral groove extending around the perimeter of the lower sheet with bottom walls of the continuous groove forming a continuous rectangular perimeter footprint for the pallet.

According to a further feature of the invention, the upper sheet defines a top wall forming the platform structure and a plurality of circumferentially spaced upwardly opening protrusions extending downwardly from the top wall and nesting within the continuous groove in the lower sheet to form the groove structures.

According to a further feature of the invention, the pallet further includes a plurality of spacer knobs protruding from one of the sheets and fused to the other sheet and serving to space portions of the upper sheet from portions of the lower sheet; at least certain of the spacer knobs are arranged in rows; and the beam members are positioned between adjacent rows of the spacer knobs.

According to a further feature of the invention, the spacer knobs are provided in and extend upwardly from the lower sheet and are fused to an underface of the upper sheet.

According to a further feature of the invention, the pallet further includes upstanding locator knobs positioned between adjacent rows of spacer knobs and engaging an underface of a respective beam member.

According to a further feature of the invention, the pallet further defines a central groove structure opening upwardly in the platform structure and extending between the peripheral groove structure proximate one side edge of the pallet and the peripheral groove structure proximate the opposite side edge of the pallet.

According to a further feature of the invention, the pallet further includes aligned slots in side walls of the peripheral groove structures and in side walls of the central groove structure to allow passage of the forks of a forklift truck.
The invention twin sheet pallet, according to a further aspect of the invention, comprises an upper generally rectangular sheet and a lower generally rectangular sheet selectively fused together to form a generally rectangular pallet having an upper platform structure; the lower sheet is formed with a continuous peripheral upwardly opening groove and a central upwardly opening groove extending from the peripheral groove proximate one side edge of the lower sheet to the peripheral groove proximate an opposite side edge of the sheet; and the upper sheet defines a top wall forming the platform structure and a plurality of circumferentially spaced upwardly opening protrusions, extending downwardly from the top wall and fusedly nested in the continuous peripheral groove in the lower sheet to form a continuous double walled thickness peripheral groove structure, and a plurality of central upwardly opening protrusions extending downwardly from the top wall and fusedly nested in the central groove in the lower sheet to form a double walled thickness central groove structure.

According to a further feature of the invention, the underface of the pallet is configured to define a rectangular perimeter footprint surface and a metal rod is positioned proximate the footprint surface along each side edge of the rectangular footprint surface.

According to a further feature of the invention, each rod is positioned in a downwardly opening channel provided in the footprint surface.

According to a further feature of the invention, each rod is encapsulated by the lower sheet of the pallet by fused plastic material plugging the channel opening following positioning of the rod in the channel.

According to a further feature of the invention, each rod includes a substantially straight main body portion and cranked end portions and the rods are arranged in end to end relation with the cranked end portion of one rod positioned proximate but unconnected to the cranked end portion of an adjacent rod.

According to a further feature of the invention, each cranked end portion extends outwardly toward the respective side edge of the footprint surface.

The invention also provides a method of forming a generally rectangular reinforced twin sheet plastic pallet comprising first and second plastic sheets selectively fused together with metallic beam members encapsulated therebetween.
The invention methodology comprises thermoforming the first sheet to include four elongated channel structures arranged in end to end relation; with the first sheet in a heated state, placing a beam member in each channel structure in end to end relation and with the adjacent beam ends spaced apart; thermoforming the second sheet and fusing it to the first sheet to encapsulate the beam members in the channel structures; and allowing the fused together sheets to cool to allow the pallet to shrink both end to end and side to side to bring the spaced adjacent ends of the beam members together to form a continuous rectangular frame configuration.

According to a further feature of the invention methodology, the beam members have beveled ends which are brought together in response to pallet shrinkage to form a bevel joint between each set of adjacent beam members.

According to a further feature of the invention methodology, the lower sheet of the pallet is configured so that an underface of the lower sheet defines a continuous rectangular footprint surface for the pallet and a metallic rod is positioned proximate the footprint surface along each side edge of the footprint surface.

According to a further feature of the invention methodology, each rod is positioned in a downwardly opening channel provided in the footprint surface.

According to a further feature of the invention methodology, following positioning of each rod in the respective channel, plastic material is fused into the opening of the channel to encapsulate the rod within the lower plastic sheet.

According to a further feature of the invention methodology, each rod includes a substantially straight main body portion and cranked end portions and the rods are arranged in end to end relation proximate the footprint surface with the cranked end portion of one rod positioned proximate but unconnected to the cranked end portion of an adjacent rod.

According to a further feature of the invention methodology, each cranked end portion extends outwardly toward the respective side edge of the footprint surface.

Other applications of the present invention will become apparent to those skilled in the art when the following description of the best mode contemplated for practicing the invention is read in conjunction with the accompanying drawings.
BRIEF DESCRIPTION OF THE DRAWINGS

[0032] The description herein makes reference to the accompanying drawings wherein like reference numerals refer to like parts throughout the several views, and wherein:

[0033] Figure 1 is a perspective view of the invention pallet;

[0034] Figures 2, 3, 4 and 5 are cross-sectional views taken respectively on lines 2-2, 3-3, 4-4 and 5-5 of Figure 1;

[0035] Figure 6 is a bottom perspective view of the pallet;

[0036] Figure 7 is a top view of the pallet;

[0037] Figure 8 is a side view of the pallet;

[0038] Figure 9 is an end view of the pallet;

[0039] Figure 10 is an exploded view of the pallet;

[0040] Figures 11, 12, 13, 14 and 15 are fragmentary views showing details of reinforcing beam members;

[0041] Figure 16 is a view of reinforcing rod members;

[0042] Figure 17 is a fragmentary bottom view of the pallet;

[0043] Figure 18 is a detail view taken within the circle 18 of Figure 17;

[0044] Figure 19 is a detail view looking in the direction of the arrow 19 in Figure 18; and

[0045] Figure 20 is a fragmentary perspective view of the pallet structure seen in Figure 18.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

[0046] In overview, the invention pallet is formed of lower and upper plastic sheets 12 and 14, knitted or fused together, four reinforcing steel beam members 16 encapsulated between the upper and lower sheets, and four metal rods 18 encapsulated in the underface of the pallet. Sheets 12 and 14 may be separately molded in a vacuum thermoforming process, may be formed
of an organic polymeric material such as polyethylene, and may be knitted or fused together to form the pallet in a compression molding process. The molds for vacuum forming the sheets are not shown but may be constructed in accordance with known vacuum thermoforming techniques.

[0047] Each of the upper and lower sheets is formed from a generally rectangular planar plastic sheet and the sheets are fused together utilizing the molds while the sheets are in a heated moldable state so that fusion may occur between the upper and lower sheets at any point where an interface is defined between the upper and lower sheets.

[0048] Lower sheet 12 starts out as a generally rectangular sheet of polyethylene plastic material and is vacuum thermoformed in known manner utilizing a suitable lower mold. Lower sheet 12 includes upstanding end walls 12a, upstanding sidewalls 12b, a continuously upwardly opening peripheral groove 12c extending around the perimeter of the sheet, a central upwardly opening groove 12d for connecting the portion of the peripheral groove 12c proximate one end wall 12a with the portion of the peripheral groove 12c proximate the opposite end wall 12a, and top wall portions 12e extending between side edge portions of the groove 12c and the central groove 12d. Central groove 12d includes enlarged end portions 12f, an enlarged central portion 12g, and narrow portions 12h extending between portions 12f and 12g.

[0049] Lower sheet 12 further includes a plurality of upwardly extending hollow spacer knobs 12i provided on the upper face of each top wall portion 12e. The knobs are provided in laterally spaced rows along the entire length and width of the top walls 12e. Knobs 12i have a circular truncated cone configuration except that the confronting faces 12j of the outboard knob rows extending lengthwise and width wise of the sheet are flattened to define longitudinal channels 20 for seating and locating the respective beam members 16. It will be seen that a channel 20 is provided along each outboard lengthwise edge of the sheet to accommodate a longitudinally extending beam 16 and further channels 20 are provided along each outboard end edge to accommodate a transversely extending beam 16. Note that the channels 20 along the outboard end edges to accommodate transverse beam 16 are each interrupted by an enlarged end portion 12f of the groove 12d. A row of downwardly opening upwardly extending locator knobs 12k are also provided in each top wall 12e between the rows of flattened outboard spacer knobs. Locator knobs 12k are staggered with respect to, and smaller than, spacer knobs 12i.

[0050] The underface 12m of continuous groove 12c will be seen to define a continuous rectangular perimeter footprint surface for the pallet and a downwardly opening channel 12n is
formed along each side of the rectangular footprint surface. Each channel 12n includes a straight central main body portion 12p extending parallel to a respective side edge of the footprint surface and cranked or angled end portions 12q opening in the respective side edge of the footprint surface proximate a respective corner of the footprint surface.

[0051] Upper sheet 14 starts out as a generally rectangular sheet of polyethylene plastic material and is vacuum thermoformed in known manner utilizing a suitable upper mold. Upper sheet 14 includes a generally planar top wall 14a, forming the platform structure for the resulting pallet, a plurality of circumferentially spaced upwardly opening "U" shaped protrusions 14b extending downwardly from the top wall, and a plurality of central "U" shaped protrusions 14c extending downwardly from the top wall. Protrusions 14b and 14c are sized to fit nestingly and snugly within peripheral groove 12c and central groove 12d respectively with two spaced protrusions 14b positioned along each side edge of the peripheral groove, two protrusions 14b positioned in each end portion of the peripheral groove, and two protrusions 14c positioned in the narrow portions 12h of central groove 12d.

[0052] As best seen in Figures 11, 12 and 13, each beam 16, in cross section, include sidewalls 16a, a top wall 16b including a central "V" 16c, and spaced bottom wall sections 16d terminating in lips 16e defining a central slot 16f. Beam members 16 include two end transverse beam members having a length generally corresponding to the channel structure 20 defined at each end of the lower sheet and a pair of longitudinally beam members 16 each having a length generally corresponding to the length of the channel structures 20 provided along the side edges of the lower sheet. As best seen in Figures 14 and 15, each end 16g of each beam member has a 45° bevel configuration.

[0053] Each rod 18 is sized to fit in a respective channel 12n and includes a straight main body portion 18a sized to fit in a respective channel main body portion 12p and cranked end portions 18b sized to fit in respective channel end portions 12q.

[0054] Following the vacuum forming operations to form the upper and lower sheets, and with the upper and lower sheets still in a heated moldable state, beam members 16 are positioned in the respective channel structures 20. The parameters of the various parts are chosen such that with the lower sheet in a heated condition, beam members 16 when placed in end to end relation within the channel structures 20 are spaced apart at their beveled ends by a distance "X" as best seen in Figure 14.
[0055] Following the positioning of the beam members within the channel Structures 20 of the lower sheet with the beveled ends 16g of adjacent beam members in spaced disposition, the molds are brought together in known fashion to compression press the upper sheet to the lower sheet to form the twin sheet pallet 10 with the beam member encapsulated between the upper and lower sheets and specifically with each beam member totally surrounded by upper sheet top wall 14a, a lower sheet top wall 12e and knob flats 12j. As the upper and lower sheets, in a heated moldable state, are brought together the plastic material of the sheets fuses or knits together in known manner at all areas where the upper and lower sheets form an interface. Specifically, the periphery 14d of the top wall 14a of the upper sheet is fused to the peripheral upper edge 12r of the lower sheets; the side walls 14e of each side protrusion 14b are fused to the inboard face of an indentation 12s in a side wall 12b or an end wall 12a of the lower sheet and an inboard wall 12t of the lower sheet; the bottom walls 14f of the protrusions 14b are fused to bottom walls 12u of the lower sheet groove 12; the side walls 14e of the central protrusions 14d are fused to side walls 12v of the lower sheet; the bottom wall 14f of each central protrusion 14d is fused to a respective portion of the central bottom wall 12w of the lower sheet; and the upper end of each hollow spacer knob 12i fuses to the underface 14g of the top wall 14a of the upper sheet.

[0056] As noted, the protrusions 14b are sized such that the outboard wall 14e of each protrusion 14b actually seats against the inboard face of a respective indentation 12s so that a space 22 is formed between the upper and lower sheets above and along the extent of each indentation 12s. Further, the knobs 12i serve to define a space 24 between the upper and lower sheets in the pallet areas between the side grooves and the central groove. Spaces 22 and 24 will be seen to define a twin sheet or double wall configuration for the pallet to provide structural rigidity for the pallet. Whereas all the walls of the pallet where interfaced walls of the upper and lower sheets have been fused together are illustrated as having a thickness of twice the thickness of each interface wall, it will be understood that in most applications the final thickness of the interfaced and fused together walls will be less than twice the thickness of the separate walls.

[0057] According to the invention methodology, as the pallet cools following the fusing together of the upper and lower sheets, the plastic material of the pallet shrinks significantly so that the pallet itself undergoes shrinkage both end to end and side to side to bring the spaced apart beveled ends 16g of the beam members together to form a continuous rectangular frame configuration within the pallet. Note that this methodology, whereby the beam members are not initially joined together to form a rigid frame structure but rather are placed individually within
the channel structures with their beveled end in spaced relation, avoids the problem of having the knobs defining the channel structures pull away from the beam members as the plastic material of the pallet shrinks during the cooling process while the beam members maintain their initial rigid fixed positions within the upper and lower sheets with the result that the beam members in the final, cooled pallet, are loosely positioned within the upper and lower sheets rather than being firmly encapsulated in the channel structures according to the invention methodology.

[0058] Following the fusing together of the upper and lower sheets to form the pallet and after allowing the material of the pallet to cool, a cutting or routing step is performed to form a pair of slots 26 in the sidewalls of the pallet and extending laterally across the pallet to allow the entry of the forks of a forklift truck. Specifically, an oblong cut out 28 is formed in each indentation 12s of a sidewall 12b, in the outboard sidewall 14e and the inboard sidewall 14e of the nested protrusion 14b, in an inboard wall 12t, in an inboard wall 12b, in central protrusion side walls 14e, in an inboard wall 12v, in an inboard wall 12t, and the inboard and outboard sidewalls 14e of the nested protrusions 14b, and in the indentation 12s of the other sidewall 12b. Similar cutouts 28 are formed in the end walls of the pallet to define further slots 26. The slots 26 in the various walls of the pallet coact to facilitate the handling of the pallet by a forklift truck approaching the pallet from either direction. In the completed pallet the planar top wall 14a of the upper sheet defines a generally planar platform surface for receipt of a pallet load and the bottom walls of the peripheral groove in the lower sheet and the central groove in the lower sheet coact to define a pallet footprint including a continuous rectangular perimeter footprint joined by a central footprint of the central groove.

[0059] Also following the cooling of the pallet, the rods 18 are positioned in the respective channels 12n, with the main body rod portions positioned in the main body channel portions and the cranked rod end portions positioned in the channel cranked end portions, whereafter plastic material 30 is positioned over each rod, in a plastic fusion welding operation, to encapsulate the rods in the lower face of the pallet. The plastic fusion material 30 also fills channel end portions 12x outboard of the ends of the rod crank ends so as to further encapsulate the rods. In the finished pallet, the plastic fusion material is flush with the underface of the pallet so as to hide the rods but not interfere with the ready movement of the pallet over transfer surfaces and transfer devices.

[0060] The invention pallet will be seen to provide many important advantages. Specifically, the encapsulated rectangular frame construction provides excellent rackability of the
pallet in both directions, that is, whether racked end to end or side to side. Further, the invention construction provides a continuous longitudinally extending footprint along the underface of the pallet so that the pallet can pass easily over barriers and irregular transfer surfaces and transfer devices such for example as conveyors. Further the invention construction provides firm entrapment for the forks of the forklift truck so that the pallet even if unevenly loaded will not tend to tip off of the forks of the pallet as the pallet is lifted and transported by the fork. Further, the reinforcing rods augment the reinforcing action of the reinforcing beams and further contribute to the rackability of the pallet in both directions. Specifically, because the rod ends are cranked and the spaces around the rod ends are filled in with plastic weld, the bottom of the finished plastic pallet cannot stretch under edge racking tension beyond what the stretch rods will allow. In effect, the upper steel beams and the lower steel rods are held efficiently in shear by the plastic structure creating a combined plastic/steel truss much stiffer than the individual components would be if they were not locked together. The invention pallet is also extremely simple in construction and therefore relatively inexpensive to produce and yet is extremely sturdy so as to provide an extremely long useful life. The invention construction also lends itself to simple and effective cleaning operations between pallet usages.

[0061] While the invention has been described in connection with what is presently considered to be the most practical and preferred embodiment, it is to be understood that the invention is not to be limited to the disclosed embodiments but, on the contrary, is intended to cover various modifications and equivalent arrangements included within the spirit and scope of the appended claims, which scope is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures as is permitted under the law.
In the claims:

1. A twin sheet plastic pallet including an upper plastic sheet and a lower plastic sheet selectively fused together to form a generally rectangular pallet having an upper platform structure, characterized in that:
   the pallet further includes a metallic support structure positioned beneath the platform structure between the upper and lower sheets and including a plurality of beam members arranged end to end in a rectangular frame configuration with each beam member generally parallel to a respective outer edge of the pallet.

2. A pallet according to claim 1 wherein each beam member is spaced inboard with respect to the respective outer edge of the pallet.

3. A pallet according to claim 2 wherein the pallet defines a peripheral groove structure opening upwardly in the platform structure between each beam member and the respective outer edge of the pallet.

4. A pallet according to claim 3 wherein:
   each groove structure is formed by portions of the upper sheet fused to portions of the lower sheet;
   the portions of the lower sheet forming the groove structures comprise a continuous upwardly opening groove extending around the perimeter of the lower sheet with bottom walls of the continuous groove forming a continuous rectangular perimeter footprint surface of the pallet.

5. A pallet according to claim 4 wherein the pallet further includes a metal rod structure positioned proximate the footprint surface along each side edge of the footprint surface.

6. A pallet according to claim 5 wherein the metal rod structure comprises a metal rod positioned along each side edge in a downwardly opening channel provided in the footprint surface.
7. A pallet according to claim 6 wherein each rod is encapsulated by the lower sheet by fused plastic material plugging the channel opening following positioning of the rod in the channel.

8. A pallet according to claim 5 wherein each rod includes a substantially straight main body portion and cranked end portions and the rods are arranged in end to end relation with the cranked end portion of one rod positioned proximate but unconnected to the cranked end portion of an adjacent rod.

9. A pallet according to claim 8 wherein each cranked end portion extends outwardly toward the respective side edge of the footprint surface.

10. A pallet according to claim 4 wherein the upper sheet defines a top wall forming the platform structure and a plurality of circumferentially spaced upwardly opening protrusions extending downwardly from the top wall and nesting within the continuous groove in the lower sheet to form the groove structures.

11. A pallet according to claim 3 wherein:
the pallet further includes a plurality of spacer knobs protruding from one of the sheets and fused to the other sheet and serving to space portions of the upper sheet from portions of the lower sheet;
at least certain of the spacer knobs are arranged in rows; and
the beam members are positioned between adjacent rows of spacer knobs.

12. A pallet according to claim 11 wherein the spacer knobs are provided in and extend upwardly from the lower sheet and are fused to an underface of the upper sheet.

13. A pallet according to claim 12 wherein the pallet further includes upstanding locator knobs positioned between adjacent rows of spacer knobs and engaging an underface of a respective beam member.

14. A pallet according to claim 3 wherein:
the pallet further defines a central groove structure opening upwardly in the platform structure and extending between the peripheral groove structure proximate one side edge of the pallet and the peripheral groove structure proximate an opposite side edge of the pallet.

15. A pallet according to claim 14 wherein:
   each groove structure is formed by portions of the upper sheet fused to portions of the lower sheet; and
   the portions of the lower sheet forming the groove structures comprise a continuous upwardly opening perimeter groove extending around the perimeter of the lower sheet and a central upwardly opening groove extending between the perimeter groove structure proximate one side edge of the pallet and the perimeter groove structure proximate an opposite side edge of the pallet.

16. A pallet according to claim 15 wherein:
   the upper sheet defines a top wall defining the platform structure and a plurality of upwardly opening protrusions extending downwardly from the top wall and nesting in the continuous perimeter groove and in the central groove to form the groove structures.

17. A pallet according to claim 16 wherein the pallet further includes aligned slots in side walls of the peripheral groove structures and in sidewalls of the central groove structure to allow passage of the forks of a forklift truck.

18. A pallet according to claim 17 wherein the pallet further includes a plurality of spacer knobs protruding from one of the sheets and fused to the other sheet and serving to spaced portions of the upper sheet from portions of the lower sheet.

19. A pallet according to claim 18 wherein at least certain of the spacer knobs are arranged in rows; and
   the beam members are positioned between adjacent rows of spacer knobs.

20. A twin sheet plastic pallet including an upper generally rectangular sheet and a lower generally rectangular sheet selectively fused together to form a generally rectangular pallet having an upper platform structure, characterized in that:
the lower sheet is formed with a continuous peripheral upwardly opening groove and a central upwardly opening groove extending from the peripheral groove proximate one side edge of the lower sheet to the peripheral groove proximate an opposite side edge of the lower sheet; and

the upper sheet defines a top wall forming the platform structure and a plurality of circumferentially spaced upwardly opening protrusions extending downwardly from the top wall and fusedly nested in the continuous peripheral groove in the lower sheet, to form a continuous double wall thickness peripheral groove structure, and a plurality of central upwardly opening protrusions fusedly nested in the central groove in the lower sheet to form a double walled thickness central groove structure.

21. A pallet according to claim 20 wherein the pallet further includes aligned slots in sidewalls of the peripheral groove structure and in side walls of the central groove structure to allow passage of the forks of a forklift truck.

22. A pallet according to claim 21 wherein the pallet further includes a plurality of spacer knobs protruding from one of the sheets and fused to the other sheet and serving to space portions of the upper sheet between the groove structures from portions of the lower sheet between the groove structures.

23. A pallet according to claim 22 wherein:
the spacer knobs immediately inboard of the peripheral groove structure are arranged in parallel adjacent rows; and
metallic beam members are positioned between the adjacent parallel rows.

24. A method of forming a generally rectangular reinforced twin sheet plastic pallet comprising first and second plastic sheets selectively fused together with metallic beam members encapsulated therebetween, the method comprising:
thermoforming the first sheet to include four (4) elongated channel structures arranged in end to end relation;
with the first sheet in a heated state, placing a beam member in each channel structure in end to end relation and with the adjacent ends of the beam members spaced apart;
thermoforming the second sheet and fusing it to the first sheet to encapsulate the beam members in the groove structures; and
allowing the fused together sheets to cool to allow the pallet to shrink both end to end and side to side to bring the spaced apart ends of the beams together to form a continuous rectangular frame configuration.

25. A method according to claim 24 wherein:
the beam members have beveled ends which are brought together in response to pallet shrinkage to form a beveled joint between each set of adjacent beam members.

26. A method according to claim 25 wherein:
the channel structures are defined by parallel rows of spacer knobs protruding from the first sheet and fused to the second sheet and serving to space portions of the first sheet from portions of the second sheet and to define the depth of the channel structures.

27. A method according to claim 26 wherein:
the first sheet is a lower pallet sheet and the second sheet is an upper pallet sheet; and
the knobs project upwardly from the lower sheet and are fused to an underface of the upper sheet.

28. A method according to claim 24 wherein the first sheet is a lower plastic sheet and the second sheet is an upper plastic sheet and wherein the method includes the further step of configuring an underface of the lower sheet to define a continuous rectangular perimeter footprint surface for the pallet and positioning a metal rod structure proximate the footprint surface along each side edge of the rectangular footprint surface.

29. A method according to claim 28 wherein the metal rod structure comprises a metal rod positioned along each side edge in a downwardly opening channel provided in the footprint surface.

30. A method according to claim 29 wherein:
following positioning of each rod in the respective channel, plastic material is fused into the opening of the channel to encapsulate the rod within the lower plastic sheet.
31. A method according to claim 30 wherein each rod includes a substantially straight main body portion and cranked end portions and the rods are arranged in end to end relation proximate the footprint surface with the cranked end portion of one rod positioned proximate but unconnected to the cranked end portion of an adjacent rod.

32. A method according to claim 31 wherein each cranked end portion extends outward toward the respective side edge of the footprint surface.

33. A twin sheet plastic pallet including an upper plastic sheet and a lower plastic sheet selectively fused together to form a generally rectangular pallet having an upper platform structure, characterized in that:
   an underface of the lower sheet defines a continuous rectangular perimeter footprint surface for the pallet; and
   a metal rod is positioned proximate the footprint surface along each side edge of the rectangular footprint surface.

34. A pallet according to claim 33 wherein each rod is positioned in a downwardly opening channel provided in the footprint surface.

35. A pallet according to claim 34 wherein each rod is encapsulated by the lower sheet by fused plastic material plugging the channel opening following positioning of the rod in the channel.

36. A pallet according to claim 33 wherein:
   each rod includes a substantially straight main body portion and cranked end portions; and
   the rods are arranged in end to end relation with the cranked end portion of one rod positioned proximate but unconnected to the cranked end portion of an adjacent rod.

37. A pallet according to claim 36 wherein each cranked end portion extends outwardly toward the respective side edge of the footprint surface.

38. A pallet according to claim 33 wherein the pallet further includes a metallic support structure positioned beneath the platform structure between the upper and lower
sheets and including a plurality of beam members arranged end to end in a rectangular frame configuration with each beam member generally proximate to a respective outer edge of the pallet in overlying relation to a respective rod.

39. A method of forming a twin sheet plastic pallet including an upper plastic sheet and a lower plastic sheet selectively fused together to form the pallet, the method comprising:
   configuring the lower sheet so that an underface of the lower sheet defines a continuous rectangular footprint surface for the pallet; and
   positioning a metal rod structure proximate the footprint surface along each side edge of the rectangular footprint surface.

40. A method according to claim 39 wherein the metal rod structure comprises a metal rod positioned along each side edge in a downwardly opening channel opening in the footprint surface.

41. A method according to claim 40 wherein following positioning of each rod in the respective channel plastic material is fused into the opening of the channel to encapsulate the rod within the lower plastic sheet.

42. A method according to claim 40 wherein:
   each rod includes a substantially straight main body portion and cranked end portions; and
   the rods are arranged in end to end relation proximate the footprint surface with the cranked end portion of one rod positioned proximate but unconnected to the cranked end portion of an adjacent rod.

43. A method according to claim 42 wherein each cranked end portion extends outwardly toward the respective side edge of the footprint surface.

44. A method according to claim 39 wherein the method includes the further step of providing a metallic support structure positioned beneath the platform structure beneath the upper and lower sheets and including a plurality of beam members arranged end to end in a
rectangular frame configuration with each beam member generally proximate to a respective outer edge of the pallet in overlying relation to a respective rod.