

Title "PALLET AND PROCESS OF MANUFACTURE THEREOF".

The present invention refers to a pallet for the storage and transport of various loads. More particularly, the invention refers to the process of manufacture of a pallet comprising a light, flexible and compression-resistant material.

Description of the prior art

A pallet used for storage and transport of loads can be evaluated by its functionality, performance and quality, by means of the analysis of the parameters such as mechanical resistance and size, static and dynamic stability, among others. Such parameters must meet the requirements established in accordance with the user's needs, handling and movement, and this involves two basic questions: the raw materials and the constructivity used in assemblage and manufacture of the pallet. However, the cost involved in production is a restricting factor for the scope of the pallet design. Often, a functional, efficient and good quality pallet having all the desirable characteristics is costly and its production is considered unfeasible.

Evaluation parameters

Mechanical resistance is one of the determining factors of the total admissible load of the pallets. Both the raw materials used and the constructive configuration directly affect this matter. A pallet with low mechanical resistance has a low admissible load capacity, and may buckle or even become damaged depending on the total weight placed thereon, thus jeopardizing the safety of the load(s).

Size stability is achieved by using easy to handle raw materials that have low sensitivity in relation to climactic changes such as temperature and humidity. The production process may correct any size discrepancies, but this action involves cost and often the cost of repeated work is high because both allocation of specialized manpower and time could be used in other production processes.

Static stability is particularly important in stacking the loads on the pallet and in stacking the pallets on top of one another when not in use. The constructive configuration of the pallets should allow for a maximum

quantity of stacked loads without risking their sliding or instability due to any constructive defect in the pallet interface. Therefore, the interface should not only have a physical space to place the loads, but also offer stability and safety for the loads themselves. The same can be said of the stacking of the
5 pallets. Currently, it is commonplace to stack unused pallets in order to streamline space or to use them for other production purposes. The structure should be such that the pallet does not damage another pallet beneath it.

Dynamic stability is related to the matter of slipping or sliding of
10 the forks of the forklift trucks when inserting them into the pallets. Many currently known pallets are not able to maintain perfectly stability on the forks, and this may give rise to sliding and consequently damage the loads when the trucks move the pallets. The design of the pallet must also take into consideration other types of movement in which the pallet is subject during the
15 production process such as, for example, transport via a conveyor belt that moves horizontally and vertically. Both the constructive configuration and the material used influence the dynamic stability, and a material having low attrition (friction) facilitates sliding.

The parameters explained above directly influence the various
20 processes involved in handling pallets such as palletization (separation of stacked pallets and placement of loads on pallets), unitization (grouping of various lesser load volumes into a single larger volume on the pallet) and export (transport, movement and unloading of the pallet).

Raw Materials

25 The choice of raw materials is a fundamental and determinant stage for the pallet design, and it can become a limiting factor upon the design scope depending on the needs and requirements. The performance of the constructive configuration directly depends on the material used and vice-versa.

30 Most currently known pallets are built of wood or injected plastic.

The wooden pallets have a relatively low manufacturing cost and also are easy to produce and structurally sound. However, this material

presents certain problems such as fragility to attack by pests such as termites and the need to use nails or threads, which may damage the load placed upon the pallet, in joining the parts. Another drawback involves the difficulty of size control of the wood, and this fact may prejudice process automation besides creating difficulties in storing the pallets when not in use.

Despite the low manufacturing cost, wooden pallets may be costly due to the need to carry out the fumigation process, especially for exporting pallets. Fumigation consists of applying chemical products on the wood to disinfect the pallet, eliminating pests such as termites. This process is time-consuming and also costly, and adds to the final cost of the pallet as well as to the cost of transporting goods.

Lastly, the final disadvantage of wooden pallets concerns sustainability and environmental preservation. The use of wood causes deforestation and negatively impacts the environment. Therefore, the sustainability requirements are compromised, and the natural resource will potentially be depleted or become scarce.

Injected plastic parts have good durability, inherent pest resistance, and require no nails because generally injected plastic pallets are made in a single unit. However, this material has drawbacks such as low friction (instability), difficulty in repairing and the high cost involved in the manufacture of an injection mold. Thus, the production cost increases the final price of the pallet and, in most cases, the high cost of production of a plastic pallet makes its use unfeasible.

In this backdrop, it can be said that until the present invention there was no a pallet that brings together all the desired requirements and functionality at low cost. The user was often obliged to opt for certain characteristics whilst renouncing others due to the limitations dictated by cost, material and constructivity of the pallet.

Objectives of the invention

A first objective of the present invention is to propose a process of manufacture of a pallet which meets the requirements of functionality presented above and have good performance, keeping the final cost relatively

low.

It is another objective of the present invention a process of manufacture of a pallet having high productivity and low costs, by means of a sole machine that, additional to sewing operations, enables the positioning of the arched supports on the bags with easy and speed.

Additionally, it is also the object of the invention a pallet obtained by the process of manufacture thereof.

Brief Description of the Invention

The objective of the present invention is achieved by a pallet used for storage and transport of loads comprising at least:

- a loads arrangement surface capable of accommodating said loads and
- two support elements associated to the loads arrangement surface and capable of sustaining said loads, said support elements being positioned substantially parallel therebetween and capable of supporting loads, each support element being provided with a substantially cross section of a circular dome-shaped kind and having an upper limit and a lower limit, the loads arrangement surface being positioned in some place between the upper and lower limits of the support elements, the surface being positioned nearer of the upper limit than of the lower limits.

Additionally, the objective of the present invention is achieved by a process of manufacturing a pallet used for storage and transport of loads, the pallet comprising (i) a loads arrangement surface capable of accommodating said loads, (ii) at least two support elements associated to the loads arrangement surface and capable of sustaining said loads, positioned substantially parallel therebetween and capable of supporting loads, wherein each support element is provided with a substantially cross section of a circular dome-shaped kind and having an upper limit and a lower limit and (iii) wherein the loads arrangement surface is positioned in some place between the upper and lower limits of the support elements, the surface being positioned nearer of the upper limit than of the lower limits. The process the process comprises the following steps:

Step I – positioning at least one main bobbin of fabric and at least one accessory bobbin in a manufacturing machine;

Step II – feeding fabric by the bobbins in a disposition defining two substantially parallel layers;

5 *Step III* – sewing the layers of fabric by means of one or more sewing heads, fed by one or more seam lines, defining at least one bag;

Step IV – cutting the pallet on the desired length and finishing sewing threads; and

10 *Step V* – arching at least one support and moving the bag of the pallet over the arched support;

the *steps I* to *V* being performed in a single manufacturing machine.

Brief Description of the Drawings

The present invention will now be described in greater detail, with reference to the drawings appended hereto, wherein:

15 Figure 1 – represents a perspective view of the support element of the pallet sustained on any surface;

Figure 2 – represents a perspective view of a first embodiment of the pallet object of the present invention;

Figure 3 – represents a front view of the pallet illustrated in figure 2;

20 Figure 4 – represents a perspective view of a second embodiment of the pallet object of the present invention;

Figure 5 – represents a front view of the pallet illustrated in figure 4;

Figure 6 – represents a perspective view of a third embodiment of the pallet object of the present invention;

25 Figure 7 – represents a front view of the pallet illustrated in figure 6;

Figure 8 – represents a perspective view of a fourth embodiment of the pallet object of the present invention;

Figure 9 – represents a front view of the pallet illustrated in figure 8;

30 Figure 10 – represents a perspective view of a fifth embodiment of the pallet object of the present invention;

Figure 11 – represents a front view of the pallet illustrated in figure 10;

Figure 12 – represents a perspective view of a sixth embodiment of the

pallet object of the present invention;

Figure 13 – represents a front view of the pallet illustrated in figure 12;

Figure 14 – is a perspective view of the support element of the pallet illustrated in figure 12;

5 Figure 15 – is a front view of the support element illustrated in figure 14;

Figure 16 – is a front view of a surface for receiving loads and a base of the pallet illustrated in figure 12;

Figure 17 – represents a perspective view of a seventh embodiment of the pallet object of the present invention;

10 Figure 18 – represents an upper view of the pallet illustrated in figure 17, without the surface for receiving load;

Figure 19 – represents a front view of the pallet illustrated in figure 17, without the surface for receiving load;

15 Figure 20 – represents a perspective view of a eighth embodiment of the pallet object of the present invention;

Figure 21 – represents an upper view of the pallet illustrated in figure 20, without the surface for receiving load;

Figure 22 – represents a front view of the pallet illustrated in figure 20, without the surface for receiving load;

20 Figure 23 – is a schematic side view of a machine to assembly the pallet object of the present invention;

Figure 24 – is a schematic upper view of the machine to assembly the pallet object of the present invention; and

25 Figure 25 – is a schematic front view of the machine to assembly the pallet object of the present invention.

Detailed Description of the Drawings

Some examples of preferred embodiments of the pallet 1 subject matter of the present invention are presented bellow. In all the examples, the pallet 1 comprises a load arrangement surface 2 sustained on two ore more support elements 3. Preferably, three support elements 3 are used, however, this number may be altered in accordance with the desired functional need and requirements.

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The loads arrangement surface 2 has a fabric covering and is capable of accommodating any type of load provided that the total weight limit is respected and provided the load does not damage it. The fabric covering extends to the support elements 3, enveloping them, and they are held together by simple sewing. Other types of join are possible, such as, for example, special glue or soldering. Preferably, a fabric comprising raffia is used. Raffia is a low cost material made of synthetic fibers transformed from polypropylene. Its main characteristics include high mechanical resistance, good size stability (easy to mold), facility to clean and high thermal stability, in addition to providing sufficient attrition to stabilize the load placed on the pallet 1 without sliding. Another kind of natural, synthetic or artificial fabric can be used as long as its characteristics do not compromise the functionality and safety requirements achieved when using raffia.

The loads arrangement surface 2 comprises four ends: a first end 201, a second end 202, a third end 203 and a fourth end 204. The first end 201 and the second end 202 are arranged in parallel to one another at opposite ends to the surface 2 and the third end 203 and the fourth end 204 are arranged in parallel to one another at opposite ends to the surface 2 and intersecting with the first and second ends 201, 202. The pallet 1 also comprises a base 5 that is capable of providing support for pallet 1 on an external means, which is formed by the extension of the fabric covering of the loads arrangement surface 2. Said external means can be represented by any external surface or by the loads arrangement surface itself of another pallet 1, when these are not in use and are stacked vertically. Accordingly, pallet sliding can be avoided when, for example, being transported in a conveyor belt, due to the friction provided by the raffia, thus improving the dynamic stability.

The support element 3, which is supported on an outer surface 4 (figure 1), has a three-dimensional geometrical shape and is made of a light, flexible and compression-resistant material. Preferably, this material comprises an alveolar type plastic such as, for example, the so called Polyonda[®]. The alveolar structure is characterized by a double-layered physical arrangement capable of sustaining weights and movements of all kinds of

loads. Polyonda[®] is a thermoplastic and comprises other characteristics such as high thermal resistance and impermeability. Evidently, another kind of material can be used as long as the functionality and safety requirements provided by alveolar plastic are maintained. Further, alveolar plastic can be
5 used in conjunction with any other material such as cardboard or some other kind of plastic.

Preferably, the cross section of the support element 3 is of a circular dome-shaped kind, which provides good support and safety for the load(s) placed on the loads arrangement surface 2. This type of configura-
10 tion, working together with the alveolar plastic, has good mechanical resistance and, consequently, good total admissible load capacity. Moreover, the support elements 3 are configured such as to allow stable contact with the forks of the fork-life truck, preventing the pallet 1 from slipping when said forks are inserted and during load movement and transport by the fork-lift
15 trucks. Accordingly, good dynamic stability is achieved. In some preferred embodiments, illustrated in figures 2 to 11, the convex section of the dome-shaped support element 3 faces the loads arrangement surface 2 and the concave section of the dome-shaped support element 3 faces the base 5. Yet this dome-shaped geometric format is not the only possible solution, and
20 other variations are permitted, both in the geometric shape as in the constructive configuration. Therefore, the support element 3 may have the three-dimensional shape of a triangular dome, a parallelepiped or even irregular geometric shapes, provided that the pallet 1 has the intended safety and reliability.

25 The longitudinal section of the support element 3 extends from the perpendicular projection of the third end 203 to the perpendicular projection of the fourth end 204 to provide uniform and homogeneous support for the entire area comprised by the loads arrangement surface 2.

The fabric covering merely extends through the perpendicular
30 projections of the first and second ends 201, 202, and, preferably, the apertures of the support elements 3 are not enveloped by the fabric covering. Thus, the support elements 3 also act as guides for the forks of the forklift

trucks, facilitating transport operations by the operator.

The raw materials used (fabric and alveolar plastic) facilitate the desired size stability, because these materials are easy to handle. So, if there is any discrepancy with the originally designed sizes, no special tools or specialized manpower is required to carry out the repeat work and, even if it does generate material wastage, the damage would be much less compared to conventional raw materials. Besides these and other functional advantages explained previously, the raw materials used are recyclable, that is, the fabric and the alveolar plastic can be reused to manufacture other pallets or even other products for other uses. Therefore, the negative environmental impact is reduced, whilst achieving a sustainable yield.

Some examples of variations of the pallet 1 are presented below.

First embodiment

The first embodiment of the pallet 1 is illustrated in figures 2 and 3. Each of the three support elements 3 are externally and individually enveloped by the extension of the fabric covering of the loads arrangement surface 2. In this embodiment, the loads arrangement surface 2 only comprises the fabric covering which, in turn, comprises the raffia. This is one of the preferred embodiments.

Second embodiment

The second embodiment of the pallet 1 is illustrated in figures 4 and 5. The three support elements 3 are externally and jointly enveloped by the extension of the fabric of the loads arrangement surface 2. Thus, the fabric covering envelops the entire structure of the pallet 1, providing greater stability and safety, but with a greater fabric consumption compared to the first embodiment.

Third embodiment

The third embodiment of the pallet 1 is illustrated in figures 6 and 7. The loads arrangement surface 2 comprises a substantially rigid sustainment platform 205 in addition to the fabric covering. The sustainment platform 205 is rectangular in shape and encompasses the entire area of the

loads arrangement surface 2.

The raw materials used to manufacture this sustainment platform 205 must have rigidity and thickness in accordance with the use requirements. Thus, cardboard, alveolar plastic itself or any kind of material that
5 meets the needs can be used.

The sustainment platform 205 is positioned between the support elements 3 and the fabric covering of the loads arrangement surface 2, in such a way that the loads are sustained on the support elements 3, and the fabric covering is sewn thereon to avoid slipping on the support elements 3.

10 Fourth embodiment

The fourth embodiment of the pallet 1 is illustrated in figures 8 and 9. In this configuration, the support platform 206 is placed between the support elements 3 and the fabric covering of the base 5 of the pallet 1. The support platform 206 is rectangular in shape and encompasses the entire
15 area projected perpendicularly from the loads arrangement surface 2. The extension of the fabric covering of the loads arrangement surface 2 is sewn on the support platform 206.

As regards the raw materials, the same observations made for the sustainment platform 205 can be applied to the support platform 206.

20 The support sustainment 205 of the third embodiment and the support platform 206 of the fourth embodiment can be implemented together in another embodiment, thus increasing the mechanical resistance and static stability of the pallet 1.

Fifth embodiment

25 The fifth embodiment of the pallet 1 is illustrated in figures 10 and 11. This constructive configuration is similar to the fourth embodiment, but instead of a support platform 206, there are three support platforms 207 also rectangular in shape, but smaller in width. Thus, two or more support platforms 207 can be extended like a frame which extends from the perpendicular
30 lar projection of the first end 201 to the perpendicular projection of the second end 202 of the pallet 1. As in the fourth embodiment, the extension of the fabric covering of the loads arrangement surface 2 is sewn to the sup-

port platforms 206.

Sixth embodiment

The sixth embodiment of the present invention is illustrated in figures 12 and 13 and comprises at least two support elements 3 capable of sustaining loads. Each support element 3 is provided with a cross section is of a substantially circular dome-shaped kind having at least an upper limit 6 and a lower limit 7. The dome-shaped constitution and the alveolar structure confer a mechanic resistance enabling the support element 3 to support static load of around 6,000 kg, despite the fact that it weights only 2.7 kg. It thus presents low manufacturing costs and a very high performance in supporting loads, in opposition to other known geometrically formed support elements, which show worse results in term of mass x load capacity ratio.

As a matter of comparison, a wood pallet weights 28 kg, hardening the procedures for its transporting (it is hard for a man alone to carry one, for example).

In this embodiment, considering that preferably the cross section is substantially circular dome-shaped (similar to an arc), the upper limit 6 is the point of inflexion of the arc, representing its upper point. On the other hand, the lower limits 7 consist in any point(s) of the base of the arc, representing the lower points of said arc.

Specifically, the loads arrangement surface 2, associated to the support elements 3, is disposed in some place between the upper and lower limits 6,7 of the support elements 3. The surface 2 must be positioned nearer of the upper limit 6 than of the lower limits 7, enabling a load area substantially plan and stable for positioning loads.

In other words, the assembly composed of the support elements 3 and the loads arrangement surface 2 creates a portion for positioning loads substantially plan and having an increased area, without deforming easily, even in the case of absence of a support platform.

It is important to note that the surface 2 is not positioned to match the upper limits 6, since this solution enables the undesirable deformation of the surface 2 under medium to high loads.

This embodiment also comprises at least a base 5 associating the lower limits 7 of the support elements 3 therebetween in order to increase the resistance and stability of the pallet.

Seventh embodiment

5 The seventh embodiment of the present invention is illustrated in figures 17 to 19 and comprises two additional support elements 3 positioned substantially parallel therebetween and substantially perpendicular with respect to the other two support elements 3. Hence, this embodiment has four support elements 3, a first support positioned at the first end 201 of the
10 pallet, a second support 3 positioned at the second end 202, a third support 3 positioned at the third end 203 and a fourth support 3 positioned at the fourth end 204. This pallet has a quadrilateral reinforced shape which enables the support of heavy loads with stability and small deformation of the base 2.

Eighth embodiment

15 The eighth embodiment of the present invention is illustrated in figures 20 to 22 and, analogously, considering that preferably the cross section is substantially circular dome-shaped (similar to an arc), the upper limit 6 is the point of inflexion of the arc, representing its upper point. On the other hand, the lower limits 7 consist in any point(s) of the base of the arc,
20 representing the lower points of said arc.

 Specifically, the loads arrangement surface 2, associated to the four support elements 3, is disposed in some place between the upper and lower limits 6,7 of the support elements 3. The surface 2 must be positioned nearest of the upper limit 6 than of the lower limits 7, enabling a load area
25 substantially plan and stable for positioning loads.

 In other words, the assembly composed of the support elements 3 and the loads arrangement surface 2 creates a portion for positioning loads substantially plan and having an increased area, without deforming easily, even in the case of absence of a support platform.

30 It is important to note that the surface 2 is not positioned to match the upper limits 6, since this solution enables the undesirable deformation of the surface 2 under medium to high loads.

This embodiment also comprises at least a base 5 associating the lower limits 7 of the support elements 3 therebetween in order to increase the resistance and stability of the pallet.

The pallet comprises two additional support elements 3 positioned substantially parallel therebetween and substantially perpendicular with respect to the other two support elements 3. Hence, this embodiment has four support elements 3, a first support positioned at the first end 201 of the pallet, a second support 3 positioned at the second end 202, a third support 3 positioned at the third end 203 and a fourth support 3 positioned at the fourth end 204. This pallet has a quadrilateral reinforced shape which enables the support of heavy loads with stability and small deformation of the base 2.

Additionally, the four support elements 3 are dimensioned and positioned in a manner that they show a length smaller than the length of the corresponding first, second, third and fourth end 201,202,203,204. As a result, both openings 10 of all supports 3 are free and open to allow the positioning of a fork of the forklift. Hence, the pallet can be suspended/transported by any of the first to fourth ends, increasing its convenience.

It is important to note that, in any embodiment of the pallet from sixth to eighth, the surface 2 and the base 5 are directly associated in order to form a single piece to involve externally the supports 3. Figure 16 shows the surface 2 and a base 5 in one single piece according to the sixth embodiment of the present invention. Here, the single piece is previously assembled and ready to receive the support elements 3 by means of bags 9, simplifying the manufacture of the pallet 1.

Additionally, due to the high planarity of the load surface 2, even when supporting high loads, any embodiment of the pallet from sixth to eighth can be used (and loaded) upside down, that is to say, the surface 2 and the base 5 can be inverted, increasing the possibility of use. This use is not possible in the case of embodiments one to four of the present pallet.

Another important advantage of the pallet object of the present

invention is that, when used to transport raw material in the form of plastic resin or the like, the pallet 1 can be melted together with the resin it previously transported. In this situation, the pallet can be advantageously manufactured with the same resin it will transport and it will perform a “one way trip” to the factory where the resin (and the pallet) will be melted for the manufacturing of polymeric goods. Considering this, the pallet object of the present invention is in fact part of the raw material to be transported and hence its cost will be null. Another advantage is that the costs with the recycling of the pallet are null. In other situation, the pallet object of the present invention can be used in complementation with the use of the already known pallets, with advantageous results regarding costs. Here, the conventional pallet (for example, the pallet manufactured with wood) is used internally in a first company (i.e. an industry), and the goods produced are transported to other place by means of the pallet 1 object of the present invention. In this situation, the first company can spent more resources buying expensive pallets for internal use (to transport goods within its factory), and buy the cheap pallet 1 object of the present invention for the goods to be transport for example to a second company. While the goods are being transported within the factory of the first company, the pallet 1 object of the present inventions, loaded, is positioned, and transported, over the regular pallet, and the assembly is transported. The regular pallet acts as a base of the pallet 1 object of the present invention, being solely a device for internal use. Hence, the regular pallet does not leave the factory, avoiding costs for acquisition of others or the expensive costs for transporting them back.

Another advantage in the use of the pallet 1 object of the present invention during the transport between two companies is that there is an increase in the available space on the truck, ships or whatever, since its height is at least 16 centimeters inferior to the height to a conventional pallet. In case of the positioning of several pallets one over the other, this mean a high increase in available space.

The process of manufacturing the pallet is also a new and inven-

tive invention.

Although it can be manufactured in a conventional manner, by means of manual or mechanical sewing of the assembly formed by the base 2 and surface 5, succeeded by the insertion of the two or more supports 3, preferably the manufacturing process is made by means of a specific developed machine, including the steps described following.

The process herein described is focused on manufacturing the embodiment illustrated in figures 12 and 13, but evidently it can be used to manufacture any other embodiment, provided that some minor adjustments, mainly regarding the positioning of bobbins of fabric, are made.

At least one main bobbin of fabric 100 and at least one (but preferably two) accessory bobbins 100' are provided in a manufacturing machine 50, in a manner that the two accessory bobbins are positioned side by side and substantially over the main bobbin (see figures 23 to 25).

The fabric fed by the three bobbins are sewn by means of one or more sewing heads 101, feeding two layers of fabric in a substantially parallel disposition. In order to enable the sewing, one or more seam lines 102 are provided.

Preferably, position sensors and pullers 103 are provided in order to pull both fabrics in a synchronized manner, optimizing (reducing to the minimum required) the consumption of fabric.

The two accessory layers of fabric provided by the two accessory bobbins 100' are sewed over the main layer of fabric, defining the two mentioned apertures/bags 9 to enable the positioning of said support elements 3. Evidently, the sewing are made specifically according to the embodiment of the pallet to be manufactured, but in all of them the creation of the bags during the sewing of the two layers is determined by the positioning of the accessory bobbins with respect to the main one.

After the sewing process, the speed of the resulting sewn fabric is reduced, in order to enable it to pass in a following station 104 for cutting the pallet on the desired length as well as finish of sewing threads. After that, the pallet is already cut and ready for receiving the support 3 (in the preferred

embodiment, two support positioned parallel to each other), which is made by means of a specific device that arches them to a circular dome-shaped format.

5 After such operation, the bags 9, and as a consequence the pallet as a hole, are moved over the arched supports 3, the insertion preferably being facilitated by the use of compressed air to reduce adherence between both surfaces.

The most innovative aspect of the current manufacturing process is the positioning 105 of the supports 3 into the bags 9 on a step within the
10 same machine that sewn the pallet. This characteristic enables consistently the speed of the manufacture of the pallet and hence reduces the manufacturing costs, an important issue when considering the reduced price of the product, especially to make it viable against the regular wood pallet.

It is important to note that the machine 50 can be used to manu-
15 facture any specific embodiment of the pallet, regardless the number and positioning of the supports and considering the existence, or not, of one or more sustainment or support platforms 205,206,207. The machine must be slightly adapted for producing such pallets, like repositioning the accessory bobbins 100' depending of the quantity and positioning of supports 3 (and, as
20 a consequence, of the respective bags 9). In case of use of sustainment or support platforms 205,206,207, the machine 50 must have any conventional mean to feed and position then on the correct place between the layers of fabric in order to permit the correct sewn.

In essence, the present process of manufacture of a pallet com-
25 prises the following steps:

Step I – positioning at least one main bobbin of fabric 100 and at least one accessory bobbing 100' in a manufacturing machine 50;

Step II – feeding fabric by the bobbins 100,100' in a disposition defining two substantially parallel layers;

30 Step III – sewing the layers of fabric by means of one or more sewing heads 101, fed by one or more seam lines 102, defining at least one bag 9;

Step IV –cutting the pallet on the desired length and finishing sewing threads; and

Step V – arching at least one support 3 and moving the bag 9 of the pallet over the arched support 3;

- 5 the steps I to V being performed in a single manufacturing machine 50.

Finally, a pallet as described above and thus produced is also a new and inventive invention.

- 10 Having being described some examples of preferred embodiments, it must be understood that the scope of the present invention encompasses other possible variations, and is only limited by the content of the claims appended hereto, which include possible equivalents.

CLAIMS

1. Process of manufacturing a pallet used for storage and transport of loads, the pallet comprising (i) a loads arrangement surface (2) capable of accommodating said loads, (ii) at least two support elements (3) associated to the loads arrangement surface (2) and capable of sustaining said loads, positioned substantially parallel therebetween and capable of supporting loads, wherein each support element (3) is provided with a substantially cross section of a circular dome-shaped kind and having an upper limit (6) and a lower limit (7), and (iii) wherein the loads arrangement surface (2) is positioned in some place between the upper and lower limits (6,7) of the support elements (3), the surface (2) being positioned nearer of the upper limit (6) than of the lower limits (7),

the process being characterized in that it comprises the following steps:

Step I – positioning at least one main bobbin of fabric (100) and at least one accessory bobbin (100') in a manufacturing machine (50);

Step II – feeding fabric by the bobbins (100,100') in a disposition defining two substantially parallel layers;

Step III – sewing the layers of fabric by means of one or more sewing heads (101), fed by one or more seam lines (102), defining at least one bag (9);

Step IV – cutting the pallet on the desired length and finishing sewing threads; and

Step V – arching at least one support (3) and moving the bag (9) of the pallet over the arched support (3);

the steps I to V being performed in a single manufacturing machine (50).

2. Process according to claim 1, characterized in that the step I comprises the positioning two accessory bobbins (100') side by side and substantially over the main bobbin (100).

3. Process according to claim 2, characterized in that, at the step III, two accessory layers of fabric provided by the two accessory bobbins (100') are sewed over the main layer of fabric, defining two bags (9) to enable the positioning of two support elements (3), the sewing being made spe-

cifically according to the embodiment of the pallet to be manufactured.

4. Process according to claim 1, characterized in that the step V uses compressed air to reduce adherence between the bag (9) and the arched support (3).

5 5. Process according to claim 1, characterized in that the step III is preceded by a step of feeding and positioning of at least one sustainment or support platform (205,206,207) on the correct place between the layers of fabric in order to permit the correct sewn.

6. Pallet, used for storage and transport of loads, comprising (i) a
10 loads arrangement surface (2) capable of accommodating said loads, (ii) at least two support elements (3) associated to the loads arrangement surface (2) and capable of sustaining said loads, positioned substantially parallel there between and capable of supporting loads, wherein each support element (3) is provided with a substantially cross section of a circular dome-
15 shaped kind and having an upper limit (6) and a lower limit (7), and (iii) wherein the loads arrangement surface (2) is positioned in some place between the upper and lower limits (6,7) of the support elements (3), the surface (2) being positioned nearer of the upper limit (6) than of the lower limits (7), the pallet being characterized by being manufactured by a process ac-
20 cording to claims 1 to 5.