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PAPER PALLET

FIELD OF INVENTION

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The present invention relates to pallets for supporting goods to be transported by vehicle such as a forklift vehicle and methods for making the same and more particularly, pallets made of recyclable paper materials.

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BACKGROUND OF THE INVENTION

Conventionally, pallets are made out of wood in order to achieve high load-carrying capacity. Wooden pallets however, possess a few disadvantages, the main drawback
15 being the weight. Compared to paper pallets, despite being more robust in strength, wooden pallets can pose a problem if human labour is required for the transportation of wooden pallets. Besides the weight, wooden pallets also have a relatively short useful lifespan as they are returned and disposed if it is deemed not usable for supporting and transporting goods. Additionally, wooden pallets are to be subjected to
20 a special treatment process to prevent spread of vermin such as insects, rats, bacteria and the like in accordance to the new legislation imposed by the Food and Agricultural Organization thus increasing the cost of manufacturing and assembling wooden pallets.

25 These disadvantages can be overcome by using paper pallets if the main drawbacks posed by paper pallets which are low load-carrying capacity and low strength are solved. Pallets manufactured from corrugated cardboards or layered cardboards are well-known in the prior art. Paper pallets have the advantages of being recyclable, more economical and environmental friendly. Nevertheless, many manufacturers
30 struggle to ensure that the paper pallets produced solves the two main drawbacks

mentioned above. Other manufacturers face difficulties in manufacturing and assembling a strong and sturdy paper pallet due to a more complicated structure of the paper pallet.

- 5 For example, one prior art disclosed by international patent application, WO 95/29849 shows a pallet made of multi-layered papers or cardboards. This invention as disclosed by the patent application relates to a pallet with a base section and a deck that are essentially formed by rectangular tubes. The base sections' tubes are further supported by square tubes to form a stiffer base while the deck tubes are merely
- 10 hollow tubes formed by two U-beams, placed respectively into each other. The deck of the paper pallet supports goods that are to be transported. Since the deck of the paper pallet is hollow, it is not sturdy and is easily crushable during transportation if the goods supported are of substantial weight.
- 15 International patent application WO 2008/144854 disclosed another paper pallet, made of criss-crossing longitudinal elements that forms a top part and a plurality of supporting elements. As disclosed by the patent application, supporting elements may be square, circular or U-shaped cut-outs. Similar to the prior art disclosed above, the disclosed paper pallet has a top portion, or a deck portion that are formed by criss-
- 20 crossing U-shaped elements or hollow rectangular elements, formed by the combination of two U-shaped elements. Thus, the top portion may not possess sufficient strength to support goods that are of substantial weight.

- Another international patent application WO 94/02366 disclosed a pallet
- 25 manufactured from recyclable cardboard that is formed by two layers of criss-crossing beams with a corrugated cardboard sheet on top of each layer. The beams are essentially hollow tubes surrounded by a corrugated cardboard. The hollow tubes are arranged next to each other for support as the corrugated cardboard holds them in place. The hollow tubes thus provide sturdiness and strength to the pallet, but the
- 30 utilization of consecutive hollow tubes in the beams would increase the weight and

the cost of the pallet. Furthermore, such arrangement of hollow tubes as means of support implies that the only way to hold these tubes in place is by surrounding them with corrugated cardboards. The strength of this pallet therefore, is entirely dependant on the tubes and removing any one of the tubes would effect the rigidity and
5 sturdiness of the pallet's structure. Another drawback of this paper pallet is that the top portion that supports the goods to be transported is made of only a few pieces of covering plate which may be corrugated cardboards. Since the beams on the upper layer are substantially spaced apart from each other and is of same height as the beams of the lower layer as shown in the diagrams, the arrangements of beams on the
10 upper layer does not act as a deck or a top portion but instead, as a supporting means so as to enable the disclosed pallet to be a four-way pallet instead of a two-way pallet.

To overcome the shortcomings of previous paper pallets design, the present invention tends to provide a paper pallet to mitigate or obviate the aforementioned problems.
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SUMMARY OF INVENTION

Based on the shortcomings of the prior arts, there is a need for a pallet, made of
20 recyclable paper materials that is sturdy, cost effective and has a simpler method of assembly.

It is therefore a main objective of the present invention to provide a pallet made of recyclable paper that is lightweight but sturdy.
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Another objective of the present invention is to provide a paper pallet that is economical to assemble.

Yet another objective of the present invention is to provide a method of manufacturing
30 and assembling a paper pallet that is simple and does not require specific machinery.

Still another objective of the present invention is to provide a paper pallet that is sizable according to the requirements of a transport vehicle such as a forklift vehicle during its manufacturing and assembling process.

- 5 According to a preferred embodiment of the invention, there is provided a pallet for supporting goods to be transported by vehicle such as a forklift vehicle and methods for making the same and more particularly, pallets made of recyclable paper materials. The paper pallet comprises of a plurality of elongate members that form a top portion of the pallet and a plurality of beams that form a bottom portion as means to support
10 the top portion. Items that are to be transported by a vehicle such as a forklift vehicle are placed on the plurality of elongate members while supported by the plurality of beams.

- In a preferred embodiment, the elongate members and beams are constructed from a
15 plurality of elongate L-shaped elements and a plurality of supporting elements of different heights. The elements are then secured to each other to form a substantially sturdy and rigid structure to support the transported goods. The preferable securing means are staples due to its availability, ease of usage and cost effectiveness. The arrangement of elements in the present invention ensures that stress exerted on the
20 pallet are distributed more evenly to the supporting elements and L-shaped elements that essentially connects the supporting elements.

- In another preferred embodiment, a cardboard is placed above the pallet, on the surface of the plurality of elongate members to cover the plurality of elongate
25 members. Placing the cardboard would hide voids and apertures formed by parallelly arranged elongate members to allow the transportation of smaller size goods on the pallet thus preventing goods from falling through the pallet during transportation or when lifted by a forklift vehicle.

The method of assembling the pallet of the present invention involves arranging and placing the L-shape elements and supporting elements in place prior to securing them together. The elements of the present invention enables a modularisation of the paper pallet as certain L-shaped elements and supporting elements are removable during
5 assembly in order to decrease materials cost or weight.

The present preferred embodiments of the invention consists of novel features and a combination of parts hereinafter fully described and illustrated in the accompanying drawings and particularly pointed out in the appended claims; it being understood that
10 various changes in the details may be effected by those skilled in the arts but without departing from the scope of the invention or sacrificing any of the advantages of the present invention.

15 BRIEF DESCRIPTION OF THE DRAWINGS

These and other features, aspects and advantages of the present invention will be more fully understood when considered with respect to the following detailed descriptions, appended claims and accompanying drawings wherein:

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Fig. 1a – b is a perspective view of a wooden pallet (500).

Fig. 2a is a perspective view of a paper pallet (100).

Fig. 2b is a perspective view of another embodiment of the paper pallet (100).

Fig. 3a is a top view of the first embodiment of the paper pallet (100)
25 according to Fig. 2a.

Fig. 3b is a bottom view of the first embodiment of the paper pallet (100)
according to Fig. 2a.

DETAILED DESCRIPTION OF THE INVENTION

The present invention relates to pallets for supporting goods to be transported by vehicle such as a forklift vehicle and methods for making the same and more
5 particularly, pallets made of recyclable paper materials.

Hereinafter, the invention shall be described according to the preferred embodiments of the present invention and by referring to the accompanying description and drawings. However, it is to be understood that limiting the description to the preferred
10 embodiments of the invention and to the drawings is merely to facilitate discussion of the present invention and it is envisioned that those skilled in the art may devise various modifications without departing from the scope of the appended claim.

A paper pallet (100) comprises of a plurality of elongate members (200) that form a
15 top portion of the pallet (100) and a plurality of beams (300) that form a bottom portion as means to support the top portion. Conventionally, in pallet terms, the top portion is called the deck (501), thus the elongate members (200) are called the top deckboards (502) while the beams (300) that form the bottom portion are called stringers (503). The bottom portion may also be formed by supporting blocks (504). A
20 conventional wooden pallet (500) is shown in Fig. 1a and Fig. 1b, in which, the elements of the paper pallet (100) of the present invention emulate the elements of the wooden pallet (500) to maintain a good structural integrity while solving the drawbacks of the wooden pallet (500).

25 Items that are to be transported by a vehicle such as a forklift vehicle are placed on the plurality of elongate members (200) and supported by the plurality of beams (300).

Referring now to Fig. 2a, there is shown a preferred embodiment of the present
30 invention. In this preferred embodiment, the pallet (100) depicted is of a two-way

entry type, wherein, the fork of the forklift vehicle is only allowed entrance into the page or out the page in accordance to the orientation of the pallet (100) shown in Fig. 2a. The elongate members (200) and beams (300) of the pallet (100) are preferably constructed from a plurality of L-shaped elements (20a – f) and a plurality of supporting elements (30a – c, 40).

As can be seen in Fig. 2a, one elongate member (200) may be constructed from two L-shaped elements (20a, 20b) and a plurality of supporting elements (30a – c). In a preferred embodiment, the supporting elements (30a – c) are cylindrical elements that form annular rings. Annular rings supporting elements (30a – c) are utilized for convenience of assembly, aesthetic purposes and cost effectiveness. The height of the supporting elements (30a – c) is preferably the thickness of the elongate member (200), hence the top portion.

Even though the supporting elements (30a – c) are essentially annular rings in the preferred embodiment, it may take on other shapes, cylindrical or tubular, as long as the structural integrity of the supporting elements (30a – c) is maintained. The supporting elements (30a – c) may be square cut-outs, solid cut-outs, hexagonal cut-outs or the like.

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To form one elongate member (200), the supporting elements (30a – c) of the elongate member (200) are lined in an axis (25) and two L-shaped elements (20a, 20b) are preferably placed, opposite each other with a portion of the inner surface of the L-shaped elements (20a, 20b) being in contact with a portion of the outer surface of the supporting elements (30a – c). The L-shaped elements (20a, 20b) mirror each other along the axis (25). The L-shaped elements (20a, 20b) are oriented in such a way that it covers the supporting elements (30) from the top and from the side, thus forming a flat top surface of the elongate member (200). This orientation would be advantageous as it would provide a flat planar surface to support the goods on the top portion of the pallet (100).

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Again referring to Fig. 2a, the supporting elements (30) are not necessarily, although they may be, arranged side by side with at least a portion of the outer surface of each supporting elements (30) are in contact with a portion of the inner surface of the L-shaped elements (20a, 20b). By not having the limitation of arranging the supporting
5 elements (30) side by side, the pallet of the present invention has the advantage of being more lightweight and economical in terms of materials cost.

In a preferred embodiment, two supporting elements (30a, 30b) are arranged adjacent to each other on the axis (25), at least a portion of the outer surface being in contact
10 with each other. A gap is accommodated before a third supporting element (30c) is added on the axis (25). Another gap is accommodated before another two adjacent supporting elements (30a, 30b) are added to the axis (25) as shown in Fig. 2a. In a preferred embodiment, the supporting elements (30) of the elongate member (200) has the same repetitive pattern. The plurality of elongate members (200) are arranged in
15 parallel to form the top portion.

Still referring to Fig. 2a, in a preferred embodiment, the beam (300) are constructed by having the supporting elements (40) for the beam (300) lined in a beam's axis (35) as four L-shaped elements (20c - f) are placed symmetrically, around the beam's axis
20 (35) enclosing the supporting elements (40), forming the corners of an essentially rectangular cross section of the beam (300). The supporting elements (40) of the beam (300) may take on any shape as long as the structural integrity of the supporting elements (40) is maintained. In a preferred embodiment, the supporting elements (40) of the beam (300) are cylindrical elements that are sectioned to be higher than the
25 supporting elements (30a - c) of the elongate member (200). The height of the supporting elements (40) is preferably the thickness of the bottom portion to accommodate the thickness of the fork of a forklift vehicle when it enters the gap between two consecutive beam (300).

30 Similar to the elongate member (200), the supporting elements (40) are not

necessarily, although they may be, arranged side by side with at least a portion of the outer surface of each supporting elements (40) are in contact with a portion of the inner surface of the L-shaped elements (20c - f).

- 5 In a preferred embodiment, as can be seen in Fig. 2a, the supporting elements (40) are arranged in such a way that, each supporting elements (40) supports one of the elongate member (200) as the elongate member (200) runs across the plurality of beams (300) in a criss-crossing manner. The consecutive supporting elements (40) are thus not in contact with each other and are equally spaced apart. Therefore, the
10 distance between consecutive parallel elongate members (200) are equivalent to the distance between consecutive supporting elements (40) for the beam (300).

As seen in Fig. 2a, the arrangement of the supporting elements (30a - c, 40) in a preferred embodiment is such that one supporting element (40) of the beam (300)
15 supports two adjacent supporting elements (30a, 30b) of the elongate member (200). Each beam (300) is preferably placed directly below two adjacent supporting elements (30a, 30b) of the elongate member (200) that are side by side. Although not necessary, such arrangement improves the structural integrity of the pallet (100) as the stress produced by goods place on top of the plurality of elongate members (200) are
20 distributed more evenly, among the L-shaped elements (20a, 20b) of the elongate member (200) and the supporting elements (30a - c, 40).

The placement of the supporting elements (30c) between two sets of adjacent supporting elements (30a, 30b) is to provide better rigidity to the elongate member
25 (200) and to accommodate the stress produced when the fork of the forklift is in contact with the bottom surface of the elongate member (200) during transportation. The presence of the supporting elements (30c) prevent the plurality of elongate members (200) from flattening and to remain rigid.

30 However, in another embodiment, the supporting elements (30) of the elongate

member (200) may be arranged, spaced apart from each other without having adjacent supporting elements (30a, 30b). In this embodiment, one supporting element (40) of the beam (300) supports one supporting element (30) of the elongate member (200).

- 5 Another possibility of achieving such arrangement is to structurally combine the both the supporting elements (30, 40) to form a higher supporting element thus eliminating the usage of upper L-shaped elements (20c, 20d). These embodiments are directed to a cost saving cause. To add to the structural rigidity of this embodiment, shorter L-shaped elements are placed around the higher supporting element, thus partially
10 enclosing it, to further support the elongate element (200).

In another preferred embodiment, the two way pallet (100) of Fig. 2a may be structured to form a four way entry pallet (not shown). Fig. 3a shows a view of the two way entry pallet (100) as seen from above. A four way entry pallet essentially
15 allows the fork of the forklift vehicle to enter from any one of the four sides of the pallet as shown by the arrows in Fig. 3a. To form a four way entry pallet, the two bottom L-shaped elements (20e, 20f) are preferably not included during assembly of the pallet. Thus the pallet is solely supported by the supporting elements that are equally spaced apart as shown in Fig. 2b. Without the bottom L-shaped elements (20e,
20 20f), the fork of a forklift vehicle can penetrate the pallet from the left and right side as well, as seen in Fig. 3a hence making the pallet a four way pallet. However, to improve the structural integrity of this preferred embodiment, supporting elements of the type used for the elongate members (with shorter height) are added between the consecutive supporting elements along the beam. The additional supporting elements
25 sit between the two L-shaped elements (20c, 20d) and two consecutive supporting elements of the beam, adding to the rigidity of the beam and preventing the L-shaped elements (20c, 20d) from being flattened. The additional supporting elements ensure that the pair of L-shaped elements (20c, 20d) do not fail when when the fork comes in contact with the L-shaped elements (20c, 20d) to elevate the pallet and transport the
30 goods on the plurality of elongate members. To allow for double stacking of the four

way entry pallet, the bottom surface of the supporting elements (40) may be covered with shorter L-shaped elements.

Other embodiments is also possible as the present invention is constructed solely
5 using the plurality of L-shaped elements (20) and the plurality of supporting elements (30, 40) of different heights.

In another embodiment, the bottom L-shaped elements (20e, 20f) are not included as shown in Fig. 2b to decrease materials cost.

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In another embodiment, the pallet (100) may be formed by a plurality of L-shaped elements (20), layered and adhered to each other to increase the thickness of the L-shaped elements (20), thus the sturdiness of the pallet (100).

15 In yet another embodiment, the pair of L-shaped elements (20a and 20b, 20c and 20d, 20e and 20f) may be combined to form U-shape elements without affecting the structural integrity of the pallet. The L-shape elements (20c – f) that enclose the supporting elements (40) may also be substituted by a rectangular element.

20 In still yet another embodiment, L-shaped elements are added to the opposing sites of the top portion, perpendicular to the plurality of elongate members (200) to add to the rigidity of the pallet (100) by covering the exposed cross section of the L-shaped elements (20a, 20b) of the elongate element (200).

25 In still yet another embodiment, a cardboard, either corrugated or layered, may be placed above the pallet (100), on the surface of the plurality of elongate members (200) to cover the plurality of elongate members (200). Placing the cardboard would hide voids and apertures formed by parallelly arranged elongate members (200) to allow the transportation of smaller size goods on the pallet (100) thus preventing
30 goods from falling through the pallet during transportation or when lifted by a forklift

vehicle. It also helps with load distribution of the goods.

The method of assembling the pallet (100) of the invention is preferably carried out by manual labour, but it may also be achieved by automated machines with suitable jigs and placement arms. The method of assembling the pallet (100) is described in detail in the following paragraphs.

The pallet (100) as shown in a preferred embodiment of Fig. 2a is formed by two main elements, which are L-shaped elements (20) and supporting elements (30,40) of different heights for the elongate member (200) and the beam (300). The supporting elements (30, 40) are preferably circular cutouts but could be of any suitable shape. The elements (20,30,40) are preferably secured together by staples but may be of any suitable securing means such as glue, screws or nuts and bolts. Staples are preferably used for ease of assembly while ensuring that the elements (20,30,40) are sufficiently secured to each other.

A first step of assembly is to construct the elongate member (200). The elongate member (200) is constructed by first arranging the supporting elements in an axis (25) and two L-shaped elements (20a, 20b) preferably placed, opposite to each other with at least a portion of the inner surface of the L-shaped elements (20a, 20b) being in contact with a portion of the outer surface of the supporting elements (30a – c). Two supporting elements (30a, 30b) are first arranged to be adjacent to each other, side-by-side along the axis (25). A third supporting element (30c) is placed on the axis (25), preferably spaced apart from the two adjacent supporting elements (30a, 30b). Such arrangement forms a repetitive pattern as can be seen in Fig. 3a and Fig. 3b. The L-shaped elements (20a, 20b) mirror each other along the axis (25). The L-shaped elements (20a, 20b) are oriented in such a way that it covers the supporting elements (30a – c) from the top and from the side, thus forming a flat top surface of the elongate member (200). The supporting elements (30a – c) and the L-shaped elements (20a, 20b) are secured to each other by utilizing a stapling means and a plurality of

staples. The top and the side of the L-shaped elements (20a, 20b) as can be referred to Fig. 2a, are stapled to the supporting elements (30a – c) accordingly. Stapling means is a preferred method of securing due to its availability, ease of usage and cost effectiveness. Nevertheless, other means of securing is also possible such as gluing,
5 screwing tight or bolting.

A second step of assembly is to construct the beam (300). Upon completion of the plurality of elongate members (200), the elongate members (200) are arranged parallelly as shown in Fig. 3a. The upper L-shaped elements (20c, 20d) of the beam is
10 placed to have the top surface being in contact perpendicularly, in a criss-crossing manner to the elongate members (200). The L-shaped elements (20c, 20d) are arranged to mirror each other along the beam's axis (35) in such a way that space is allocated along the axis (35) to accomodate the beam's supporting elements (40). The L-shaped elements (20c,20d), are then secured to the elongate members (200) by
15 stapling the upper surface of the L-shaped elements (20c, 20d) to the bottom surface of the elongate member (200). The staple penetrates through the L-shaped elements (20c, 20d) and into the thickness of the elongate member's (200) supporting elements (30a, 30b). The beam's supporting elements (40) are then placed between the space allocated earlier, between the upper L-shaped elements (20c, 20d) directly below each
20 elongate member (200). At least a portion of the outer surface of the supporting elements (40) is in contact with at least a portion of the inner surface of the L-shaped elements (20c, 20d) and are therefore stapled together from the side of the L-shaped elements (20c, 20d) to secure the supporting elements (40) in place. In a preferred embodiment, additional L-shaped elements (20e, 20f) are placed below the supporting
25 elements (40), thus enclosing the supporting elements (40) forming the corners of an essentially rectangular cross section of the beam (300). These additional L-shaped elements (20e, 20f) are also stapled to the supporting elements (40) from the bottom side, in which the staples penetrates through the L-shaped elements (20e, 20f) and into the thickness of the beam's supporting elements (40). The sides of the these
30 additional L-shaped elements (20e, 20f) could also be stapled to the supporting

elements (40) wherein the staple penetrates through the L-shaped elements (20e, 20f) and the thickness of the supporting elements (40).

In another embodiment, the plurality of elongate member (200) and the plurality of
5 beam (300) may be constructed separately. A method of assembling the pallet (100) according to this embodiment is by first constructing the elongate members (200) and arranging them in a substantially parallel manner. The second step is constructing the beams (300) and arranging them in a substantially parallel manner before securing both the elongate members (200) and the beams (300) together with the beams (300)
10 being secured to the bottom surface of the elongate members (200).

The elongate member (200) is constructed in the same manner as described. As the beam (300) may be constructed separately in this embodiment, the upper L-shaped elements (20c, 20d) are not necessarily secured to the elongate member immediately
15 after the plurality of elongate members (200) are constructed and arranged in a substantially parallel manner. Instead, the beam (300) may be constructed by placing the supporting elements (40) to be spaced apart from each other along the beam's axis (35) with the space accommodated being the same as the distance of two consecutive parallel elongate member (200). This is followed by arranging four L-shaped elements
20 to enclose the supporting elements (40) to form the corners of an essentially rectangular cross section of the beam (300). Lastly, the elements are to be secured to each other by a suitable securing means such as gluing means.

Upon completion, the plurality of beam (300) are secured to the plurality of elongate
25 member (200), also by the suitable securing means.

Besides the mentioned stapling and gluing position, other position may also be stapled to better secure the elements (20, 30, 40) in place. Staples size may vary and are dependant upon the thickness of the elements (20, 30, 40).

Although this disclosure has described and illustrated certain preferred embodiments of the invention, it is to be understood that the invention is not restricted to those particular embodiments. Rather, the invention include all embodiments which are functional or mechanical equivalence of the specific embodiments and features that
5 have been described and illustrated.

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CLAIMS

1. A pallet (100) made of paper materials for supporting goods comprising:
 - a top portion formed by a plurality of elongate members (200);
 - 5 a bottom portion formed by a plurality of beams (300) secured to the plurality of elongate members (200) in a criss-crossing manner to support the top portion;
 - charaterised in that
 - the plurality of elongate members (200) and the plurality of beams (300)
 - 10 are constructed from a plurality of supporting elements (30, 40) secured and arranged along the length of a plurality of elongate L-shaped elements (20) that sit on opposing sides of the plurality of supporting elements (30, 40) to form the corners of the elongate members (200) and the beams (300).
 - 15
2. A pallet (100) according to claim 1 wherein the supporting elements (30, 40) are cylindrical elements.
3. A pallet (100) according to claim 1 wherein the supporting elements (30,40)
- 20 are tubular elements.
4. A pallet (100) according to claim 1 wherein the supporting elements (30,40) are combined to form higher supporting elements.
- 25 5. A pallet (100) according to claim 1 wherein the supporting elements (30) of the elongate member (200) lie on an axis (25) as two L-shaped elements (20a, 20b) mirror each other, along the axis (25) with at least a portion of the inner surface of the L-shaped elements (20a, 20b) being in contact with at least a portion of the outer surface of the plurality of supporting elements (30).

6. A pallet (100) according to claim 5 wherein two of the supporting elements (30a, 30b) are adjacent to each other on the axis (25) and a third supporting element (30c) is spaced apart from the adjacent supporting elements (30a, 30b), also on the axis (25) to form a pattern of repetitive arrangement along the axis (25).
5
7. A pallet (100) according to claim 5 wherein the supporting elements (30) are spaced apart from each other.
- 10 8. A pallet (100) according to claim 1 wherein the beam (300) is formed of four L-shaped elements (20c – f) that enclose the plurality of supporting elements (40), forming the corners of a rectangular cross section.
- 15 9. A pallet (100) according to claim 6 or claim 8 wherein one supporting element (40) of the beam (300) is placed directly below two adjacent supporting elements (30a, 30b) of the elongate member (200).
- 20 10. A pallet (100) according to claim 6 or claim 7 wherein one supporting element (40) of the beam (300) is placed directly below one supporting element (30) of the elongate member (200).
- 25 11. A pallet (100) according to claim 1 wherein pairs of L-shaped elements (20a and 20b, 20c and 20d, 20e and 20f) are joined together to form U-shape elements.
12. A pallet (100) according to claim 1 further comprising a board on the top surface of the top portion.
- 30 13. A method of assembling a pallet (100) according to claim 1 comprising the steps of:

- a) constructing the plurality of elongate members (200) from the plurality of L-shaped elements (20a, 20b) and the plurality of supporting elements (30a – c),
- b) arranging the plurality of elongate members (200) in a substantially parallel manner, spaced apart from each other; and
- c) securing the elements (20, 40) of the plurality of beams (300) to the bottom surface of the plurality of elongate members (200).

14. A method according to claim 13 wherein the step of constructing the plurality of elongate members (200) comprises:

- a) placing two supporting elements (30a, 30b) to be adjacent to each other, side-by-side along the axis (25),
- b) placing a third supporting element (30c) spaced apart from the two supporting elements (30a, 30b), on the axis (25),
- c) repeating the placement of the plurality of supporting elements (30a – c) along the axis (25) to form a repetitive pattern;
- d) arranging two L-shaped elements (20a, 20b) opposite to each other, mirroring along the axis (25) so that at least a portion of the inner surface of the L-shaped elements (20a, 20b) is in contact with a portion of the outer surface of the plurality of supporting elements (30a – c),
- e) covering the plurality of supporting elements (30a – c) from the top and the side upon arrangement of the L-shaped elements (20a, 20b); and
- f) securing the L-shaped elements (20a, 20b) to the plurality of supporting elements (30a – c).

15. A method according to claim 13 wherein the step of securing the elements of the plurality of beams (300) comprises:

- a) placing the upper L-shaped elements (20c, 20d) of the beam (300)

to have the top surface being in contact with the bottom surface of the plurality of elongate members (200), perpendicularly, in a criss-crossing manner,

- 5 b) arranging the upper L-shaped elements (20c, 20d) opposite to each other, mirroring along the beam's axis (35) in such a way that space is allocated along the axis (35) to accommodate the plurality of supporting elements (40) of the beam (300),
- c) securing the upper L-shaped elements (20c, 20d) to the plurality of elongate members (200),
- 10 d) placing the plurality of supporting elements (40) of the beam (300) at the allocated space, between the upper L-shaped elements (20c, 20d) and directly below each elongate member (200) so that at least a portion of the inner surface of the L-shaped elements (20c, 20d) is in contact with a portion of the outer surface of the
- 15 e) securing the supporting elements (40) to the L-shaped elements (20c, 20d) from the side of the L-shaped elements (20c, 20d)

20 16. A method of assembling the pallet (100) according to claim 15 further comprises:

- a) placing two lower L-shaped elements (20e, 20f) below the plurality of supporting elements (40),
- b) enclosing the supporting elements (40) to form the corners of a rectangular cross section of the beam (300) upon placing the two
- 25 lower L-shaped elements (20e, 20f); and
- c) securing the lower L-shaped elements (20e, 20f) to the plurality of supporting elements (40) from the bottom and the side of the L-shaped elements (20e, 20f).

30 17. A method of assembling a pallet (100) of the invention according to claim 1

comprising the steps of:

- a) constructing the plurality of elongate members (200) from the plurality of L-shaped elements (20a, 20b) and the plurality of supporting elements (30a – c),
- 5 b) arranging the plurality of elongate members (200) in a substantially parallel manner, spaced apart from each other,
- c) constructing the plurality of beams (300) from the plurality of L-shaped elements (20c-d) and the plurality of supporting elements (40),
- 10 d) arranging the plurality of beams (300) in a substantially parallel manner, spaced apart from each other; and
- e) securing the plurality of beams (300) to the bottom surface of the plurality of elongate members (200).

15 18. A method of assembling the pallet (100) according to claim 17 wherein the step of constructing the plurality of elongate members (200) comprises:

- a) placing two supporting elements (30a, 30b) to be adjacent to each other, side-by-side along the axis (25),
- 20 b) placing a third supporting element (30c) spaced apart from the two supporting elements (30a, 30b), on the axis (25), repeating the placement of the plurality of supporting elements (30a – c) along the axis (25) to form a repetitive pattern;
- c) arranging two L-shaped elements (20a, 20b) opposite to each other, mirroring along the axis (25) so that at least a portion of the inner surface of the L-shaped elements (20a, 20b) is in contact with a portion of the outer surface of the plurality of supporting elements (30a – c),
- 25 d) covering the plurality of supporting elements (30a – c) from the top and the side upon arrangement of the L-shaped elements (20a, 20b); and
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- e) securing the L-shaped elements (20a, 20b) to the plurality of supporting elements (30a – c).

19. A method of assembling the pallet (100) according to claim 17 wherein the step of constructing the plurality of beams (300) comprises:

- a) placing the supporting elements (40) to be spaced apart from each other along the beam's axis (35)
- b) arranging two L-shaped elements (20c, 20d) opposite to each other other, mirroring along the beam's axis (35) so that at least a portion of the inner surface of the L-shaped elements (20c, 20d) is in contact with a portion of the outer surface of the plurality of supporting elements (40).
- c) covering the plurality of supporting elements (40) on one of the ends and the sides upon arrangement of the L-shaped elements (20c, 20d); and;
- d) securing the L-shaped elements (20c, 20d) to the plurality of supporting elements (40).

20. A method of assembling the pallet (100) according to claim 19 further comprises:

- a) placing two lower L-shaped elements (20e, 20f) on the other end of the plurality of supporting elements (40),
- b) enclosing the supporting elements (40) to form the corners of a rectangular cross section of the beam (300) upon placing the two lower L-shaped elements (20e, 20f); and
- c) securing the lower L-shaped elements (20e, 20f) to the plurality of supporting elements (40) from the bottom and the side of the L-shaped elements (20e, 20f).

21. A method of assembling the pallet (100) according to any one of claim 13 –

20, wherein securing the elements (20,30,40) is achievable by stapling means.

22. A method of assembling the pallet (100) according to any one of claim 13 –
20, wherein securing the elements (20,30,40) is achievable by gluing means.

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