Title: IMPROVEMENTS RELATING TO STILLAGES

Abstract: An apparatus for supporting a stillage wherein the apparatus includes a pallet rack (10) having at least two parallel, laterally spaced elongate frame members (11) that extend horizontally in use for supporting thereon a stillage (14) having four or more supporting feet (16). The apparatus also includes at least one foot-locating member (15) secured along an elongate frame member of the at least two parallel elongate frame members. The foot-locating member has an engagement means (22) for engaging with a foot of the stillage to define the location of the foot on the pallet rack for stabilising the stillage upon the rack. Also disclosed is a device for locating a stillage on a pallet rack.
Improvements relating to stillages

Field of the invention

The present invention relates to stillages, and more specifically to support for stillages.

Background of the invention

Stillages are used to store or transport goods. They generally include a frame base and an additional structure, such as side or corner restraints, for supporting the goods. In one form, the base is rectangular with a support foot beneath each corner.

The presence of the feet gives rise to challenges in securely settling the stillage in a desired location, particularly if the stillage is to be supported at a location elevated from the ground. Some stillages are designed to be stackable, having a downward opening in the base of each foot and upward protrusions on the top of the stillage which vertically align and cooperate with respective feet of an identical stillage placed thereupon. However, the bottom stillage in the stack must still rest on its feet, so is generally rested on a flat surface, such as flooring.

In some situations it may be desirable to settle a stillage on a pallet rack. Conventionally, a pallet rack is an open framework designed to support a pallet that has a flat bottom, rather than support feet. Such a pallet rack typically provides a support structure in the form of parallel elongated frame members, or bars, that are held in a horizontal plane, and on which a pallet may be rested. If a stillage is laid on the rack, with the feet of the stillage resting upon one or more of these parallel bars, the feet may easily be pushed off the bar by a lateral force, causing the stillage to topple. Therefore, it is desirable to provide an improved means to settle such a stillage on a pallet rack.

Reference to any prior art in the specification is not, and should not be taken as, an acknowledgment or any form of suggestion that this prior art forms part of the common general knowledge in Australia or any other jurisdiction or that this prior art could reasonably be expected to be ascertained, understood and regarded as relevant by a person skilled in the art.
Summary of the invention

In one aspect of the invention, there is provided an apparatus for supporting a stillage, the apparatus including: a pallet rack having at least two parallel, laterally spaced elongate frame members that extend horizontally in use for supporting thereon a stillage having four or more supporting feet; and at least one foot-locating member secured along an elongate frame member of the at least two parallel elongate frame members, the foot-locating member having an engagement means for engaging with a foot of said four or more feet to define the location of the foot on the pallet rack for stabilising the stillage upon the rack.

Preferably, the at least one foot-locating member is securable to the elongate frame member such that its position is adjustable along the elongate frame member. In one embodiment, the position of the at least one foot-locating member is slidably adjustable along the elongate frame member. Preferably, the position of the at least one foot-locating member is securable to the elongate frame member at an infinite number of positions along the elongate frame member. More preferably, the foot-locating member is secured by a clamping means.

In a preferred embodiment, the foot-locating member includes: a body portion having an upwardly directed engagement portion, the engagement portion including four corners arranged to define a perimeter of a rectangular space for fitting within a rectangular cup that opens downwardly from a supporting foot of the stillage such that the foot is locked against horizontal movement with respect to the engagement portion.

In embodiments of the invention, the body portion has an under-surface for resting on said elongate frame member, wherein the upwardly directed engagement portion is raised from the under-surface and configured to transfer the weight of the stillage to the elongate frame member, via the under-surface.

Preferably, the apparatus for supporting a stillage includes four foot-locating members, each foot-locating member being for engaging a corresponding foot of the said four feet.

Preferably, the pallet rack has a pair of support frames supporting the elongate frame members at respective longitudinally spaced locations, wherein the pallet rack is configured for supporting the stillage between the support frames.
In another aspect of the invention, there is provided a device for locating a stillage on a pallet rack, the pallet rack having at least two rectangular elongate frame members extending in a horizontal plane for supporting thereon a stillage having four or more supporting feet, the device including: a body portion having (i) an under-surface for resting on a said elongate frame member of the pallet rack and (ii) an engagement portion spaced from the under-surface and including four corners arranged to define a perimeter of a rectangular space for fitting within a cup above the under-surface and which opens downwardly from a supporting foot of the stillage such that the foot is locked against horizontal movement with respect to the engagement portion; and a means for clamping the body portion to said rectangular elongate frame member on the pallet rack such that the engagement portion is upwardly directed after clamping, the clamping being at a position that is adjustable along the frame member.

Preferably, the four corners define a flat horizontal plane when the body portion is clamped to the elongate frame member.

In a preferred embodiment, the rectangular space is a square space.

Preferably, the device includes opposing side members, extending from the body portion, for straddling the device around the rectangular elongate frame member to which the body portion is to be clamped.

In one embodiment, the means for clamping is provided by a pair of threaded fasteners and nuts, each fastener traversing between the opposing side members, wherein the nuts are tightened to the fasteners to press the side members toward each other for clamping the elongate rectangular elongate frame member between the side members.

In another embodiment, the means for clamping is provided by holes in at least one of the side members, wherein a fastener may be inserted therethrough for clamping a side member to the rectangular elongate frame member. Preferably, a threaded passage is aligned with each hole.

Preferably, the rectangular space has wall portions along at least two opposing sides of the perimeter of the rectangular space. Preferably, there are at least two of said wall portions, the wall portions being portions of respective opposed walls of a first pair of opposed walls that are parallel to the side members. Advantageously, the body portion may include a rectangular tube having the first pair of opposed walls and a second pair of opposed walls. Advantageously, the
four corners may be corners of a top wall that is opposed to the under surface, the top wall filling the rectangular space.

In a further aspect of the invention, there is provided a stillage kit for a pallet rack, the pallet rack having at least two parallel elongate frame members extending in a horizontal plane for supporting thereon a stillage having four or more supporting feet, the kit including: a stillage having four or more feet; and at least one foot-locating device; wherein the at least one foot-locating device is securable along an elongate frame member of a pallet rack, and includes an engagement means for engaging with a foot of said four or more feet to define the location of the foot on the pallet rack for stabilising the stillage upon the rack.

In yet another aspect of the invention, there is provided a method of producing a device for locating a stillage on a pallet rack, the pallet rack having at least two rectangular elongate frame members extending in a horizontal plane for supporting thereon a stillage having four or more supporting feet, at least one foot having a cup that opens downwardly, the method including: forming a body portion having an engagement portion, the engagement portion being in accordance with a predefined specification; and providing a means for securing the body portion along an elongate frame member of a pallet rack; wherein the predefined specification has been designed so that the engagement portion is fittable within a cup of a stillage, the cup having internal dimensions that have been factored into the predefined specification.

In a further aspect of the invention, there is provided an apparatus for supporting a stillage, the apparatus including: a rigid support having a length for spanning between parallel elongate frame members of a pallet rack that are configured to support at least one pallet thereon; and at least two foot-locating means projecting from the rigid support, the foot-locating members projecting in a common direction, wherein the at least two foot-locating means are spaced and shaped to fit within cups of respective feet of a stillage, to define the location of the respective feet on the rigid support for stabilising the stillage upon the rigid support, and in turn, on the pallet rack when the rigid support spans between the parallel elongate frame members of the pallet rack.

Preferably, the rigid support is a metal bar. In various embodiments, at least one of the foot-locating means has: a body portion including: (i) an under-surface for resting on a top surface of the rigid support, and (ii) an engagement portion opposed to the under-surface and
including four corners arranged to define a perimeter of a rectangular space and for tightly fitting within the cup of the corresponding stillage foot to lock the stillage, above the under-surface, and against horizontal movement with respect to the engagement portion.

Advantageously, the foot-locating means may be included as part of a foot-locating device, the foot-locating device further including a means for clamping the body portion to said rigid support, the clamping being at an adjustable position on the rigid support. The foot-locating means may having the features of any of the foot-locating hereinbefore described, but adapted to clamp to the rigid support instead of the elongate frame member of the pallet rack.

**Brief description of the drawings**

Further aspects of the present invention and further embodiments of the aspects described in the preceding paragraphs will become apparent from the following description, given by way of example and with reference to the accompanying drawings.

Figure 1 shows a perspective view of a portion of a pallet rack having two parallel elongate frame members and two foot-locating members or devices on each frame member, in accordance with an embodiment of the invention, and a stillage supported thereon;

Figure 2 shows the items of Figure 1 with the stillage raised above the pallet rack;

Figure 3 shows an expanded view of the circled region marked A in Figure 2;

Figure 4 shows a side cross-sectional view along line 100-100 in Figure 1;

Figure 5 shows a plan view of a foot-locating device in accordance with an embodiment of the invention;

Figure 6 shows the foot-locating device of figure 5 in a perspective view;

Figure 7 shows a perspective view of an alternative embodiment of the invention;

Figure 8 shows a cross sectional view along line 200-200 in figure 7;

Figure 9 shows a perspective view of an alternative foot-locating member in accordance with another embodiment of the invention;
Figure 10 shows a side view of a foot-locating device in accordance with another embodiment of the present invention, and showing a cross-section of an elongate frame member of a pallet rack to which the foot-locating device is mounted;

Figure 11 shows, in a side view similar to Figure 10, a foot-locating device in accordance with another embodiment of the present invention;

Figure 11A shows a perspective view of the foot-locating device of Figure 11, mounted on a segment of an elongate frame member of a pallet rack;

Figure 12 shows, in a side view similar to Figures 10 and 11, a foot-locating device in accordance with a further embodiment of the present invention;

Figure 13 shows, in a side view similar to Figures 10, 11 and 12, a foot-locating device in accordance with another embodiment of the present invention;

Figure 13A shows a perspective view of the foot-locating device of Figure 13, mounted on a segment of an elongate frame member of a pallet rack; and

Figure 14 shows two identical apparatuses, in accordance with another aspect of the present invention, for supporting a stillage on parallel elongate frame members of a pallet rack.

**Detailed description of the embodiments**

An embodiment of an aspect of the invention is shown in Figure 1. A pallet rack 10 has a first pair of parallel elongate frame members 11 that commonly extend along an axis in a horizontal plane. The elongate frame members 11 span between and are supported at each end by respective vertical support frames 12. Each support frame 12 is comprised of a pair of parallel vertical beams 13 held together by cross members 13A. The elongate frame members 11 are sized and spaced to securely support thereon at least one pallet. More commonly the elongate frame members 11 support multiple pallets, side-by-side. To support multiple generally square-based pallets, the length of the elongate frame members 11 is longer than the separation between the members so, viewed in plan, the support rack is an elongate rectangle.

The sizing and spacing of the elongate frame members 11 is generally tailored to support pallets of standardized dimensions, such as ISO standard pallet sizes 1219x1016mm (for North America), 1165x1165mm (for Australia), 1100x1100mm (for Asia), 1000x1200mm (for Europe
and Asia), and 800x1200mm (for Europe), and 1067x1067mm (for North America, Europe and Asia). In the example shown in Figure 1, the length of the pallet rack is more than three times its width, so that the rack can easily hold two or three standard pallets side-by-side.

To support additional pallets, the vertical support frames 12 also hold an (optional, but generally standard) second pair of horizontal elongate frame members 11A, elevated above the first pair 11. The second pair 11A typically is between 100 centimetres and 200 centimetres above the first pair. Given tall enough support frames 12, further pairs of horizontal elongate frame members can similarly be spaced above the second pair 12. For convenience, the embodiment of the invention exemplified hereinafter is described only with reference to the first pair of elongate frame members 11. However, the second pair 11A and any further pairs of elongate frame members are substantially similar or identical to the first pair 11, so may simultaneously be configured or adapted to be used in the same manner as the first pair 11, as described hereinafter.

As shown in Figure 1, the elongate frame members 11 are adapted to support a stillage 14 thereon by having the stillage located onto four foot-locating members or devices 15 — two of the devices 15 being secured to each elongate frame member 11. Although only one stillage is illustrated in Figure 1, it is appreciated the elongate frame members 11 are sufficiently long to comfortably support two or three stillage racks side-by-side.

The stillage 14 is shown elevated from the pallet rack 10 in Figure 2. The stillage 14 is supported by four feet 16. The stillage has a flat, open rectangular frame 18, from which corner restraints 20 vertically extend. The feet 16 extend downwardly from the bottom of the corner restraints 20, beneath the frame 18.

The supported stillage 14 is sized such that its feet 16 rest on the parallel elongate frame members 11, and is stabilised on the rack 10 by having each foot 16 located on a corresponding foot-locating member 15.

The foot-locating members 15 are adjustably positioned along the elongate frame members 11 so that each foot-locating member 15 is aligned with a corresponding foot 16 of the stillage 14. The ability to adjustably position the foot-locating members 15 allows for accommodation of a variety of different sized stillages 14 on the pallet rack 10.
Ideally, the foot-locating members 15 are capable of locking or restraining movement of the stillage 14 against any horizontal movement. In one embodiment, the restraining function can be provided by a single foot-locating member, and if the foot-locating member also locks the foot against rotational movement, then only a single foot-locating member is required to stabilise the stillage.

Figure 3 provides an expanded view of circled region A in figure 2, showing a single in-situ foot-locating member 15. The foot-locating member 15 has a body portion 21 and an engagement portion 22, which is the top edge of the body portion 21. The stillage foot 16 is essentially a downwardly opening rectangular cup 30 (figure 4), or in other words, an open or hollow rectangular frustopyramid. The rectangular cup 30 is a frustopyramid in that it inwardly tapers towards the stillage until it forms a flat portion 31 in a horizontal plane. The flat portion 31 rests on the engagement portion 22 of the foot-locating member 15. The engagement portion 22 includes four corners 24 that define a perimeter of a rectangular space 32. The four corners 24 engage with respective corners 28 within the rectangular cup 30. This engagement restrains the foot 16 against horizontal and rotational movement with respect to the engagement portion 22. The engagement portion 22 is raised above an under-surface 46 of the body portion 21, by a pair of opposed walls 36, 38. At least a portion of the under-surface 46 rests upon a top surface 47 of the elongate frame member 11 so that any load borne by the engagement portion 22 is transferred to the top surface 47 of the elongate frame member.

Commonly, the rectangular cup 30 has sides 33 (Figure 3) of equal dimension, so that the rectangular cup 30 is more specifically a square cup (i.e. it is an open frustum of square pyramid). In this case, a tight engagement between the foot 16 and engagement portion 22 is achieved by having the four corners 24 of the engagement portion 22 positioned such that rectangular space 32 is, more specifically, a square space (as shown in figure 5). The four corners 24 are also arranged to define the engagement portion 22 in a flat horizontal plane so that the engagement portion 22 rests flush against flat portion 31 within the cup 30. Each of the four corners 24 of the engagement portion 22 engage with a respective corner 28 in the cup 30.

The foot-locating member 15 can exist as a member of an assembly, or it may be a stand-alone device that is connected to any suitable pallet rack, for stabilising a stillage thereupon. Figure 5 shows, in plan view, the foot-locating member 15 as a stand-alone device. The rectangular space 32 is defined by wall portions 34 which have top edges along opposing
sides of the perimeter of the rectangular space 32. The wall portions 34 extend along the entire perimeter of rectangular space 32. Ideally, the wall portions 34 are arranged to align with vertical walls 37 (Figure 3) of the stillage's corner restraints 20 from which the feet 16 extend.

The wall portions 34 are upper portions of a first wall 36 (Figure 5), an opposed second wall 38, and third and fourth walls 44 that are perpendicular to the first wall 36 and second wall 38 to define a steel square tube 45. This square tube 45 forms the body portion 21 of the foot-locating device 15. It is appreciated that in other embodiments, rather than the body portion being a square tube 45, it may be a solid square block. As shown in Figure 5, the first wall 36 and the opposing second wall 38, along the perimeter of the rectangular space 32, are parallel to two side members 40 and 42 of the foot-locating member or device 15. In this embodiment, the side members 40, 42 are similar flat metal plates, e.g. of steel. The first side plate 40 is welded to the first wall 36 and extends along the axis of the square tube 45 beyond the bottom surface 46 (Figures 4 and 6) of the tube 45 to allow for positioning of the first side plate 40 adjacent to and abutting a lateral wall 48 of elongate frame member 11. The first side plate 40 extends beyond the under surface 50 of the elongate frame member 11. The second side plate 42 is positioned parallel and opposite the first side plate 40 to abut against lateral wall 52, opposite the other lateral wall 48 of the elongate frame member 11. The first side plate 40 and second side plate 42 are joined a pair of fasteners in the form of bolts 54 (Figure 4) respectively above and beneath the elongate frame member 11. With this arrangement, the foot-locating device 15 straddles around the elongate frame member 11.

Each bolt 54 is secured into a threaded passage 56 that is lateral to the second side plate 42. The threaded passage 56 may be a nut that is independent from, or rigidly secured to, the second side plate 42. When the bolts 54 are untightened, the foot-locating device 15 can be adjustably positioned along the elongate frame member 11 by sliding the foot-locating device along the member. Once the foot-locating member 15 has been slidably adjusted into position (of which there are an infinite number) along the elongate frame member 11, the position is secured by tightening the bolts 54 into their corresponding nuts 56, thereby pressing the side plates 40, 42 toward each other, clamping the elongate frame member 11 therebetween. After clamping, the engagement portion 22 is upwardly directed to engage with the downwardly directed cup 30 of a stillage foot 16.
This clamping action allows the foot-locating member 15 to be accommodate for a variety of elongate frame member 11 widths, wherein the maximum width that can be accommodated is determined by the maximum separation between of the first side plate 40 and second side plate 42. The maximum height of the elongate frame member 11 is essentially determined by the separation of the bolts 54.

In an alternative embodiment, as shown in Figures 7 and 8, side members 40a and 42a of foot-locating device 15a need not extend beyond the under surface 50 of the elongate frame member 11. Threaded passages in the form of nuts 58 are rigidly secured to side member 40a at holes 60 in the side member. A grub screw 62 is screwed into each hole 60 to clamp the second side member 42a against lateral wall 52a of the elongate frame member 11.

In a further embodiment, as shown in Figure 9, the square tube 45b, which forms the body portion 21b of the foot-locating device 15b, is secured to the elongate frame member 11 on a top surface 64 of the frame member 11. The bottom of square tube 45b has flanges 66. Each flange 66 has a hole 68 through which a fastener is inserted, the fastener extending into the top surface 64 of the elongate frame member 11.

In some embodiments of the invention, one or both of the side members, used in clamping the foot-locating member 15d to the elongate frame member 11, may be formed from folded sheet metal, as illustrated in Figures 10 to 13A. In the embodiment illustrated in Figure 10, the body portion 21d is welded onto a strip 80 of sheet steel. The strip 80 has an under-surface 46d that rests on the elongate frame member 11. The strip is folded away from the body portion, at locations 81 laterally flanking the body portion, to form a first side member 40d and a second side member 42d. The second side member 42b has nuts 70 on an internal surface of the side member 42d. By fastening grub screws 71 through the nuts 70 and against the elongate frame member 11, the foot-locating member 15d is laterally clamped between the inward facing tips of the grub screws 71 and the first side member 40d.

The side members 40d and 42d are inwardly folded at respective ends 82, 83 to form U-channels 84 that sit beneath the elongate frame member 11. A bottom plate 85 fits between the side members 40d, 42d, and has downwardly bent ends that slot into the U-channels 84. Like side member 42d, the bottom plate 85 has a nut 86 on an internal surface. A grub screw 87 is
fastened through nut 86 and pushes against the bottom of the elongate frame member 11 to vertically clamp the foot-locating member 15d to the elongate frame member.

Although, as described hereinbefore, the body portion 21 has been embodied by the same square tube 45, alternative constructions of the body portion may be used instead of the square tube construction. In Figures 11, the body portion 21e is formed with the same sheet steel strip 80e that forms clamping side members 40e, 42e. At the respective tops of each side member 40e, 42e, the strip 80e bends inwardly by 90 degrees to define an under-surface of body portion 21e, for resting on the elongate from member 11. The strip 80e also bends upwardly, away from the under-surface 46e, to define a neck portion 85e of the body member 21e, though which a screw and nut combination can be used to squeeze the neck 85e and, by association, side members 40e, 42e together to laterally clamp the body portion 21e to the elongate frame member 11. From the neck 85e, the strip 80e bulges outwardly and then upwardly to form upper vertical walls 36e, 38e. Each upper vertical wall has a top edge 87e, each edge having opposed corners 24e (Figure 11A) which define the perimeter of a rectangular space filled by a top wall 86e. The corners 24e, thus define an engagement portion 22e that fits within a downwardly extending cup on the foot of a stillage, as in the embodiments hereinbefore described.

Similarly to the embodiment of Figure 10, a bottom plate 85e is fitted beneath the elongate frame member by engaging in U-channels 84e at bottom ends of the side members 40e, 42e, and a screw and nut combination may be used to provide vertical clamping. In contrast with the embodiment of Figure 10, the U-channels 84e are formed by outward (rather than inward) bends of the respective side members 40e, 42e.

In the embodiment illustrated in Figure 12, the body portion 21f of foot-locating member 15f has a wall vertical 36f that is coplanar with the side wall 46f that is adjacent the foot-locating member. From wall 36f, strip 80f is bent to form a square loop 88f that includes top surface 86f, a second vertical wall 38f and a lower wall having an under-surface 46f. It will be appreciated that the engagement portion 22f is formed in the same manner as in the embodiment of Figures 11 and 11A. A separate side member 42f is fastened to the strip 80f to laterally clamp the foot-locating member to the elongate frame member.

In the embodiment illustrated in Figure 13, the body portion 21g is constructed from two separate folded steel metal strips 80g' and 80g". Each strip has an inward loop that respectively
contributes, to the body portion 21g, an outer vertical wall 36g, 38g, a top wall portion 86g', 86"g, an inner wall 90g', 90g" and a bottom wall having an under-surface portion 46g', 46g". The two strips 80g' and 80g" are held together by upper and lower screw/nut combinations, 91g and 92g, respectively. As illustrated in Figure 13A, vertical wall 38g has a hole 93g in it to allow access to the screw head of the screw/nut combination 91g. Similar to the other embodiments described herein, vertical walls 36g and 38g each have upper edges that define corners 24g of an engagement portion 22g for fitting within a rectangular cup of a stillage foot.

In an alternative embodiment (not shown), the engagement portion is formed by the respective corners of two opposing walls, wherein the walls are joined by a central transverse wall to form an I or H shaped structure in plan view. Alternatively, a body portion may be constructed in which there are no wall portions along any sides of the rectangular space. Instead, the four corners that define a rectangular space are by ends corners of diagonal walls which are crossed to create an X structure in plan view.

In another embodiment (not shown), the engagement portion of the device 15 of Figure 3 is arranged to have the rectangular space 32 rotated 45°, about a vertical axis. In this way, the four corners 24 engage with centre points 35 along sidewalls 33 of the rectangular cup 30. The four corners 24 may be joined by rectangular walls along the perimeter, or in an I, H or X structure as previously described.

In one arrangement (not shown), the cup 30 may be a circular (frustoconical) cup, and each of the four corners 24 of the engagement portion 22 engage with a respective circumferential point in the cup 30. Alternatively, the four corners 24 are included in a circumferential wall of a circular tube. The four "corners" in this case refer only to an imaginary square space within the circumference. The corners 24 are separated from each other by 90°, measured from the centre of the tube. Such an arrangement, will prevent horizontal translation of the stillage foot 16, but will not prevent rotation of the foot if only a single foot-locating member 15 of this embodiment is used. Therefore, to prevent rotation of the stillage 14, at least two such foot-locating members 15 would be required in this case.

Ideally the stillage that is placed on the pallet rack is dimensioned so that each foot 16 of the stillage rests on an elongate member 11 of the pallet rack. However, alignment requires the depth of the stillage to be essentially the same as the spacing of the parallel elongate frame
members 11. Therefore, depending on the relative dimensions of the particular stillage and pallet rack, it may not be possible to align all four feet of the stillage with the pallet rack. To accommodate stillages of different depths, pairs of stillage feet may be located onto respective pairs of foot-locating members, wherein each foot-locating member is adjustable in position along a cross-bar that is supported by the elongate frame members of the stillage rack. As illustrated in Figure 14, two stillage feet-locating apparatuses 100 traverse the elongate frame members 11. Each feet-locating apparatus 100 includes two foot-locating devices 15b, as described hereinbefore, clamped to a rigid metallic support member or elongate cross-bar 102. The foot-locating members 15b are adjustably spaced along the cross-bar 102 so that their separation corresponds with the separation of the respective feet with which they are intended to engage.

In the embodiment illustrated in Figure 14, the foot-locating member 15b is the same as the foot-locating member of Figure 9. However, it is appreciated that in other corresponding embodiments of the invention any of the other foot-locating members described herein may be used.

It is also appreciated that in some environments specific stillages will be favoured over other stillages. A storage facility may, for example, only use one (or a few) types of stillage. Thus it may be that, rather than having adjustability, it is sufficient to have a feet locating apparatus that has multiple foot-locating members in fixed locations on the apparatus. In such cases foot-locating members may be fixed to or even integrally formed on cross-bar 102. The foot-locating device 15 may be supplied with a stillage 14, the device and stillage forming a stillage kit. This is advantageous in that it allows the provision of a foot-locating device which is designed for an optimal locking arrangement for a particular stillage 14.

The optimal locking arrangement can also be realised when supplying the foot-locating device 15 separately from the stillage 14. This may be achieved by designing the foot-locating device for use with a stillage of known dimensions or a stillage having a foot 16 with a downwardly directed cup 30 of particular known dimensions. This may be achieved by producing a device 15 in accordance with a method in which a body portion 21 is formed having an engagement portion 22, wherein the engagement portion 22 is in accordance with a predefined specification. The method also includes a step of providing in the device 15 a means for securing the body portion 21 to a pallet rack 10. The predefined specification for the
engagement portion is designed so that the engagement portion 22 is fittable within a cup 30 of stillage 14, the cup having dimensions that have been factored into the predefined specification.

It will be understood that the invention disclosed and defined in this specification extends to all alternative combinations of two or more of the individual features mentioned or evident from the text or drawings. All of these different combinations constitute various alternative aspects of the invention.
CLAIMS

1. An apparatus for supporting a stillage, the apparatus including:
a pallet rack having at least two parallel, laterally spaced elongate frame members that
extend horizontally in use for supporting thereon a stillage having four or more supporting feet;

and

at least one foot-locating member secured along an elongate frame member of the at least
two parallel elongate frame members, the foot-locating member having an engagement means
for engaging with a foot of said four or more feet to define the location of the foot on the pallet
rack for stabilising the stillage upon the rack.

2. An apparatus in accordance with claim 1, wherein the at least one foot-locating
member is securable to the elongate frame member such that its position is adjustable along the
elongate frame member.

3. An apparatus in accordance with claims 1 or 2, wherein the position of the at least one
foot-locating member is slidably adjustable along the elongate frame member.

4. An apparatus in accordance with any one of the preceding claims, wherein the position
of the at least one foot-locating member is securable to the elongate frame member at an infinite
number of positions along the elongate frame member.

5. An apparatus in accordance with any one of the preceding claims, wherein the foot-
locating member is secured by a clamping means.

6. An apparatus in accordance with any one of the preceding claims, wherein the foot-
locating member includes:
a body portion having an upwardly directed engagement portion, the engagement portion
including four corners arranged to define a perimeter of a rectangular space for fitting within a
rectangular cup that opens downwardly from a supporting foot of the stillage such that the foot is
locked against horizontal movement with respect to the engagement portion.

7. An apparatus in accordance with claim 6, wherein the body portion has an under-
surface for resting on said elongate frame member, wherein the upwardly directed engagement
portion is raised from the under-surface and configured to transfer the weight of the stillage to
the elongate frame member, via the under-surface.
8. An apparatus in accordance with any one of the preceding claims, wherein the apparatus for supporting a stillage includes four foot-locating members, each foot-locating member being for engaging a corresponding foot of the said four feet.

9. An apparatus in accordance with any one of the preceding claims, wherein the pallet rack has a pair of support frames supporting the elongate frame members at respective longitudinally spaced locations, wherein the pallet rack is configured for supporting the stillage between the support frames.

10. A device for locating a stillage on a pallet rack, the pallet rack having at least two rectangular elongate frame members extending in a horizontal plane for supporting thereon a stillage having four or more supporting feet, the device including:

   a body portion having

   (i) an under-surface for resting on a said elongate frame member of the pallet rack and

   (ii) an engagement portion spaced from the under-surface and including four corners arranged to define a perimeter of a rectangular space for fitting within a cup above the under-surface and which opens downwardly from a supporting foot of the stillage such that the foot is locked against horizontal movement with respect to the engagement portion; and

   a means for clamping the body portion to said rectangular elongate frame member on the pallet rack such that the engagement portion is upwardly directed after clamping, the clamping being at a position that is adjustable along the frame member.

11. A device in accordance with claim 10, wherein the four corners define a flat horizontal plane when the body portion is clamped to the elongate frame member.

12. A device in accordance with claims 10 or 11, wherein the rectangular space is a square space.

13. A device in accordance with any one of claims 10 to 12, wherein the device further includes opposing side members, extending from the body portion, for straddling the device around the rectangular elongate frame member to which the body portion is to be clamped.
14. A device in accordance with claim 12, wherein the means for clamping is provided by a pair of threaded fasteners and nuts, each fastener traversing between the opposing side members, wherein the nuts are tightened to the fasteners to press the side members toward each other for clamping the elongate rectangular elongate frame member between the side members.

15. A device in accordance with claim 12, wherein the means for clamping is provided by holes in at least one of the side members, wherein a fastener may be inserted therethrough for clamping a side member to the rectangular elongate frame member.

16. A device in accordance with claim 15, wherein a threaded passage is aligned with each hole.

17. A device in accordance with any one of claims 10 to 16, wherein the rectangular space has wall portions along at least two opposing sides of the perimeter of the rectangular space.

18. A device in accordance with claim 17, wherein there are at least two of said wall portions, the wall portions being portions of respective opposed walls of a first pair of opposed walls that are parallel to the side members.

19. A device in accordance with any one of claims 10 to 18, wherein the body portion includes a rectangular tube having the first pair of opposed walls and a second pair of opposed walls.

20. A device in accordance with any one of claims 10 to 18, wherein the four corners are corners of a top wall that is opposed to the under surface, the top wall filling the rectangular space.

21. A stillage kit for a pallet rack, the pallet rack having at least two parallel elongate frame members extending in a horizontal plane for supporting thereon a stillage having four or more supporting feet, the kit including:

a stillage having four or more feet; and

at least one foot-locating device;

wherein the at least one foot-locating device is securable along an elongate frame member of a pallet rack, and includes an engagement means for engaging with a foot of said four
or more feet to define the location of the foot on the pallet rack for stabilising the stillage upon the rack.

22. A method of producing a device for locating a stillage on a pallet rack, the pallet rack having at least two rectangular elongate frame members extending in a horizontal plane for supporting thereon a stillage having four or more supporting feet, at least one foot having a cup that opens downwardly, the method including:

forming a body having an engagement portion, the engagement portion being in accordance with a predefined specification; and

providing a means for securing the body along an elongate frame member of a pallet rack;

wherein the predefined specification has been designed so that the engagement portion is fittable within a cup of a stillage, the cup having internal dimensions that have been factored into the predefined specification.

23. An apparatus for supporting a stillage, the apparatus including:

a rigid support having a length for spanning between parallel elongate frame members of a pallet rack that are configured to support at least one pallet thereon; and

at least two foot-locating means projecting from the rigid support, the foot-locating members projecting in a common direction,

wherein the at least two foot-locating means are spaced and shaped to fit within cups of respective feet of a stillage, to define the location of the respective feet on the rigid support for stabilising the stillage upon the rigid support, and in turn, on the pallet rack when the rigid support spans between the parallel elongate frame members of the pallet rack.

24. An apparatus according to claim 23, wherein the rigid support is a metal bar.

25. An apparatus according to claim 23 or 24, wherein at least one of the foot-locating means has:

a body portion including:

(i) an under-surface for resting on a top surface of the rigid support, and
(ii) an engagement portion opposed to the under-surface and including four corners arranged to define a perimeter of a rectangular space and for tightly fitting within the cup of the corresponding stillage foot to lock the stillage, above the under-surface, and against horizontal movement with respect to the engagement portion.

26. An apparatus according to claim 25, wherein the foot-locating means is included as part of a foot-locating device, the foot-locating device further including a means for clamping the body portion to said rigid support, the clamping being at an adjustable position on the rigid support.
Figure 12
INTERNATIONAL SEARCH REPORT

International application No. PCT/AU2012/000633

A. CLASSIFICATION OF SUBJECT MATTER

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
WPI & EPDOC: IPC/EC: B65D19/44, 19/38, A47F3/12, 3/14, A47B57/08 & Keywords (stillage, pallet, palet, rack, frame, cabinet, hold, engage, secure, fasten, fix, set, lock, leg, foot, feet, adjust, move, slide, glide, detach, release, translational, reciprocate, male, compliment, socket, cup, spigot, mating, fit and similar terms); Google Patents: keywords (stillage, platform, rack, foot, feet, secure, lock, engage, adjust, slide)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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Date of the actual completion of the international search 20 July 2012
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