



## Description

### Load supporting apparatus

This invention relates to a load supporting apparatus commonly referred to as a "flat" having a load supporting platform, and members which, in use, extend upwardly to facilitate stacking.

Such flats are used to facilitate the transportation of loads on the roads and on ships.

For road transportation the platform is loaded onto the bed of a lorry or trailer. For transportation on a ship, the platform is loaded onto the deck or into the hold of a ship and is stackable by virtue of the upstanding members which are rigid and able to support the weight of one or more flats and their loads, stacked thereon.

Conventionally, such upstanding members are pivotally attached to the platform so that when no load is supported on the platform, the end members may be folded generally parallel to the platform and thus take up less space. Thus the flats themselves may be economically transported from place to place without taking up excess space, when the flats are not loaded.

The platforms which are conventionally rectangular, commonly have at each corner, what are known as "ISO" sockets or boxes which may be engaged with corresponding "ISO" boxes or sockets at the tops of the upstanding members to facilitate stacking of the flats on board ship or at the docks.

The maximum weight and dimensions of flat and load which can be accommodated on the roads, is governed by road regulations, whilst the maximum weight and dimension of flat and load which can be accommodated on ships is governed by shipping considerations, flat design and approval regulations.

Further, regulations for systems in which flats (and their loads) are lifted on and off ships (so called "lo-lo" system) are different from a system in which lorries are driven onto the ship and driven off leaving behind the flat, and often the trailer also (so called "ro-ro" system).

A flat for lo-lo systems has hitherto been restrained by the above mentioned approval regulations from carrying as high a maximum load as is permitted for flats for ro-ro systems, because of the inherently higher weight of the lo-lo flat.

According to one aspect of the invention we provide a flat comprising a load supporting platform of generally rectangular configuration and having upstanding members at two opposite sides of the platform, the upstanding members having at their upper ends first connecting means adapted to engage with corresponding connecting means of another flat, and the upstanding members or the platform having second connecting means adapted to engage with corresponding connecting means of another flat, wherein at least one of the members is rigidly, but releasably, engaged with the platform so that when not in use, the member or members may be removed from engagement with the platform.

Preferably both of the upstanding members are releasably engaged with the platform.

Thus when the flat is being transported on a road, loaded or unloaded, the upstanding member or members can be removed because it/they is/are not required. Thus when loaded a greater load may be carried on the roads, and when unloaded, a plurality of flats may be transported on a lorry because the overall weight is reduced.

When it is required to transport a loaded flat by ship, the upstanding member or members can be secured to the platform of the flat at the docks, or even on board ship, so that a plurality of flats can be stacked as in conventional systems.

Thus it is envisaged that a supply of upstanding members would be kept at the docks, and engaged with the platforms of the flats for ship transportation, which supply would be replenished when the flats are to be transported from the docks on the roads, as the upstanding members would then be removed.

It will be appreciated that the advantage of this system is that upstanding members would not need to be carried around the country on the roads.

Preferably, an end member is secured at each of two opposite sides of the platform, usually the shorter sides.

The platform may have a first engagement means, and the or each upstanding member may have a second engagement means, the first and second engagement means being engageable with each other as the or each member and the platform are moved relatively towards each other.

The first engagement means of the platform may comprise a socket at or adjacent a corner of the platform, each socket being adapted to receive a connecting element of the second engagement means of the upstanding member.

The connecting element and the socket may each have means, which, when the upstanding member is engaged with the platform, receive a locking member to provide the rigid engagement.

The locking pin may be mounted at or adjacent a corner of the platform for sliding movement relative to the platform between a locked position in which the locking pin is engaged with the openings and an unlocked position when the upstanding member is released.

The pin may slide in a direction generally parallel to the side of the platform provided with the upstanding member.

The socket may comprise a pair of spaced elements between which the connecting element can be received.

The spaced elements may be parallel and extend generally upright.

The upstanding member may carry a guide member which is engageable with a locating element of the platform to restrain movement of the upstanding member relative to the platform about the axis of the locking pin.

The guide member and the locating element may comprise an interengageable slot and pin or other member combination so that the pin or other

member moves along the slot as the upstanding member is engaged with the platform.

The or each upstanding member may comprise a frame having at least two columns which each carry second engagement means and the guide member, where provided, to engage with a first engagement means and locating element of the platform at each of two opposite corners along one side of the platform.

Two locking pins, one at each corner of the platform may be provided and are slidable to an unlocked position to release each corner of the upstanding frame member.

The or each upstanding member may be engageable with the platform by undergoing a movement relative to the platform in a direction generally parallel with the platform i.e. generally horizontally.

The first connecting means carried by the upstanding members may comprise conventional ISO boxes and the second connecting means may be carried by the platform at corresponding positions beneath the upstanding members, and may comprise conventional ISO boxes which may be engaged with ISO boxes of another flat beneath.

The invention will now be described with the aid of the accompanying drawings in which:

FIGURE 1 is a side view of a flat in accordance with the invention.

FIGURE 2 is an enlarged exploded fragmentary perspective view of part of the flat of Figure 1, showing the connection at one corner of an upstanding frame member and the platform of the flat.

FIGURE 3 is a detailed end view of a connecting element of the upstanding frame member shown in figure 2.

Referring first to Figure 1, a flat 10 comprises a generally rectangular platform 11 which, in use, supports a load upon upper decking 12 thereof. The platform 11 may be loaded onto the bed of a lorry or trailer and transported on the roads, or may be loaded onto a ship for ship transportation of the load.

When the flat 10 is carried on a ship, it is desirable to be able to stack the flat 10 with a plurality of similar flats and accordingly at each of the two opposite, shorter, sides of the platform 11, an upstanding frame member 13,14, is provided. The end members 13 and 14 both comprise frames and carry at their upper ends first connecting means 15 which in the present example comprise ISO boxes which are adapted to engage with corresponding connecting means of a flat stacked above.

The platform 11 carries at each corner, beneath the end members 13,14, ISO boxes 16 which are adapted to engage, using conventional means such as twistlocks, with corresponding connecting means of a flat beneath, on which the flat 10 is stacked.

Of course, where the flat 10 is used with a plurality of other similar flats, the ISO boxes 16 of one flat, would be engaged with the ISO boxes 15 of a flat beneath, and/or the ISO boxes 15 on each of the end members 13,14, would be engaged with ISO boxes 16 of the flat above.

Referring now to Figures 2 and 3, part of the platform 11 is shown with the decking 12 removed. The platform 11 comprises a plurality of longitudinally extending girders 20 and cross struts 21 welded together to provide a rigid lattice.

Along each longer side of the platform 11 is a generally C-shaped girder 22, the channel of the C facing outwardly and being supported along its length by further support struts 23.

The decking 12 is laid across the lattice of struts 20,21, and is engaged with upper flanges 24 of the C shaped side girders 22.

The upstanding members 13, 14 (only one member 13 can be seen in Figure 2) comprise frames made up of columns 26 at each side, with a corrugated metal sheet 27 extending between the two columns 26, upper 28 and lower 29 cross bars being provided to add rigidity.

The ISO boxes 15 are provided at the top of each of the columns 13 which comprise hollow box-like sections.

At their lower ends, the columns 13 are each partly cut away and have an internal foot plate 27 from which extends downwardly within the column 13 a connecting element 30 of a second engagement means, which element has an opening 31 for a purpose hereinafter described.

Further the columns 13 each have a guide member 33 comprising a slot in an extension 33a of a side wall of each column.

The platform 11 has at each corner, a first engagement means comprising a pair of generally vertically upright extending flanges 34 and 35 which also each have a receiving means comprising an opening 36,37, respectively. It can be seen from Figure 2, that by moving the frame member 13 towards the platform 11 in a direction parallel to the platform 11 but perpendicularly to the shorter side of the platform 11 along which the member 13 in use lies, the connecting element 30 will be received between the two flanges 34,35, and that when the end member 13 is fully engaged, the openings 36,37, of the flanges 34 and 35 will be aligned with opening 31 in the connecting element 30.

Mounted on the platform 11 for sliding movement in a direction generally parallel to the shorter side of the platform 11 along which the end member 13 in use lies, is a locking member in the form of a pin 39. When the openings 36,37,31, are aligned, the pin 39 can be moved from an unlocked position to a locked position in which the pin 39 is received in the aligned openings to provide a releasable connection between the platform 11 and the upstanding member 13.

The openings 36, 37 are surrounded by opposed bosses 36a, 37a, which together with guide bosses 31a (see Figure 3) surrounding the opening 31 limit lateral relative movement between the frame member and platform. In addition guide blocks 41 are provided on opposite sides of the connecting element 30 to facilitate alignment of the openings 36,37,31, as the connecting element slides between flanges 34,35.

Of course, although it cannot be seen, at the opposite corners of the frame member 13 and

platform 11, a similar connecting element 30, and receiving flanges 34,35, are provided, with a locking pin so that the member 13 can be locked to the platform at each lower corner.

It can also be seen from Figure 2 that the platform 11 carries along its longest side, a locating element or pin 40 which, as the member 13 is engaged with the platform 11 is received within the slot 33 to thereby prevent any movement of the end member 13 about the axes of the locking pins 39. If desired the locating element 40 could comprise a slot and the guide member 33 comprise a pin or other member engagable in the slot of the locating element 40.

The opposite longest side of the platform to that seen, also carries a locking element 30 for engagement with a guide member similar to guide member 33 on the opposite column 26 of the frame member 13, but oppositely handed.

It will be understood that the upstanding frame member 14 is secured at the opposite shortest side of the platform 11 by a similar arrangement to frame 13, but again the connecting means, and guide members would be oppositely handed at opposite sides of the platform.

Thus when it is desired to transport a load on the road, the members 13 and 14 can be removed from engagement with the platform 11 and stowed, by sliding pins 39 from the openings of the first connecting means of the platform 11 and the second connecting means of members 13 and 14, so that less weight is carried on the roads.

Many modifications may be made without departing from the scope of the invention. For example, if desired, an alternative connecting means to the sliding locking pin 39 and openings 36 and 37 and 31 in the flanges 34,35 and connecting elements 38 may be provided.

In an alternative type of connection, the guide member 33 and locating element 40 may not be required, or an alternative means to add rigidity to the connection may be provided.

The invention may be applied to a flat having other configurations of platform to the lattice structure described. Further, the end members 13 and 14 need not comprise frames including a corrugated metal sheet 27 and columns 26 as described, but alternative configurations are possible.

For example, the upstanding members may comprise columns only, although a frame structure such as described is preferred, in order to provide the necessary rigidity.

If desired, non-standard connecting means to facilitate stacking of the flat 10 may be provided as an alternative to the ISO boxes 15 and 16 described.

It will be appreciated from the figures that the upper decking 12 of the platform is of cambered configuration so that any water falling on the decking 12 runs to the sides. Planar decking may be provided if required.

The features disclosed in the foregoing description, or the accompanying drawings, expressed in their specific forms or in terms of a means for performing the disclosed function, or a method or process for attaining the disclosed result, or a class

or group of substances or compositions, as appropriate, may, separately or in any combination of such features, be utilised for realising the invention in diverse forms thereof.

## Claims

1. A flat (10) comprising a load supporting platform (11) of generally rectangular configuration and having upstanding members (13, 14) at two opposite sides of the platform, the upstanding members (13, 14) having at their upper ends first connecting means (15) adapted to engage with corresponding connecting means (16) of another flat, and the upstanding members (13, 14) or the platform (11) having second connecting means (16) adapted to engage with corresponding connecting means (11) of another flat, characterised in that, at least one of the members (13, 14) is rigidly, but releasably, engaged with the platform (11) so that when not in use, the member or members (13,14) may be removed from engagement with the platform (11).

2. A flat according to Claims 1 wherein the platform (11) has a first engagement means (34, 35), and the or each upstanding member (13, 14) has a second engagement means (30), the first and second engagement means being engageable with each other as the or each member and the platform are moved relatively towards each other.

3. A flat according to Claim 3 wherein the first engagement means (34, 35) of the platform comprises a socket at or adjacent a corner of the platform, each socket being adapted to receive a connecting element (30) of the second engagement means of the upstanding member.

4. A flat according to Claim 3 wherein the connecting element (30) and the socket each have means (31, 36, 37) which, when the upstanding member is engaged with the platform, receive a locking member (39).

5. A flat according to Claim 4 wherein the locking pin (39) is mounted at or adjacent a corner of the platform for sliding movement relative to the platform between a locked position in which the locking pin (39) is engaged with the openings (31, 36, 37), and an unlocked position when the upstanding member (13, 14) is released.

6. A flat according to Claim 6 wherein the pin (39) slides in a direction generally parallel to the side of the platform (11) provided with the upstanding member (13,14).

7. A flat according to any one of Claims 3 to 6 wherein the socket comprises a pair of spaced parallel, generally upright, elements (34, 35) between which the connecting element (30) can be received.

8. A flat according to any one of Claims 4 to 7 wherein the upstanding member carries a guide

member (33) which is engageable with a locating element (40) of the platform to restrain movement of the upstanding member (13, 14) relative to the platform about the axis of the locking pin (39).

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9. A flat according to Claim 8 where the guide member (33) and the locating element (40) comprise an interengageable slot (33) and pin (40) or other member combination so that the pin or other member moves along the slot as the upstanding member is engaged with the platform.

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10. A flat according to any one of the preceding claims wherein the or each upstanding member (13, 14) is engageable with the platform (11) by undergoing a movement relative to the platform (11) in a direction generally parallel with the platform i.e. generally horizontally.

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