



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 308 568 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
07.05.2003 Bulletin 2003/19

(51) Int Cl.7: **E04B 1/343**

(21) Application number: **02257529.4**

(22) Date of filing: **30.10.2002**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Little, David**
Burton Pidsea, Hull (GB)

(74) Representative: **Loven, Keith James**
Loven & Co
Quantum House
30 Tentercroft Street
Lincoln LN5 7DB (GB)

(30) Priority: **30.10.2001 GB 0125986**

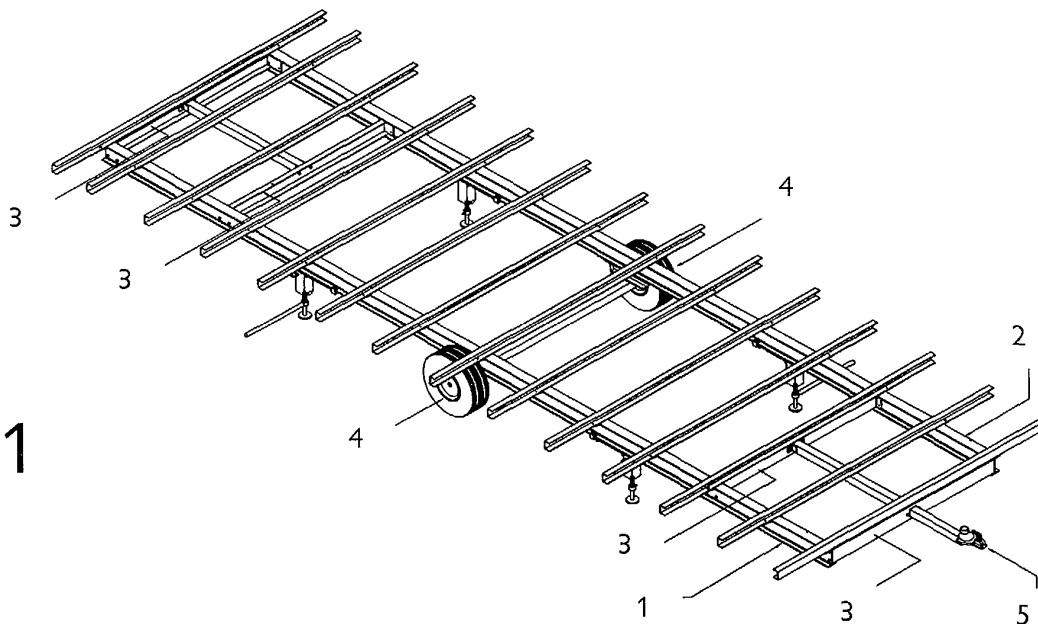
(71) Applicant: **Willerby Holiday Homes Limited**
Hull, HU9 5NA (GB)

(54) **Mobile home chassis**

(57) A mobile home comprises first and second beams (1) extending the length thereof and connected by a plurality of cross-members (3), the beams (1)

mounting wheels (4) permitting manoeuvring of the mobile home, decking extending across and connected to the upper surfaces of the beams, and a body constructed on the decking.

Fig 1



EP 1 308 568 A2

Description

Field of the Invention

[0001] This invention relates to mobile homes, and in particular to the construction and supporting of chassis for such homes.

Background to the Invention

[0002] Mobile homes have evolved from touring trailer caravans, and have a chassis with road wheels, generally centrally thereof, and a towing coupling at one end. While mobile homes are not designed to be taken on to the road, and thus will not be provided with braking systems, they are still required to be capable of movement on the wheels, for example for relocation and safety purposes.

[0003] Typically, chassis for mobile homes are individually fabricated from metal components, usually steel, supporting a wooden deck on which the mobile home structure is built up. Since it is usual to offer mobile homes in a range of lengths, and with a number of different layouts for each length, the number of different chassis required can be high, and each chassis can be relatively complex in construction, with a large number of individual metal members welded together and then wooden supports attached, on which the decking can then be constructed. This has a number of disadvantages. Firstly, this method of construction is very labour-intensive and therefore costly. Secondly, the welding operations to join together a large number of steel components means that, even if galvanised components are used, the chassis are prone to corrosion, because welding destroys the continuity of the galvanised protection. Thirdly, there is a lack of flexibility, with each type of chassis having to be ordered from the chassis manufacturer well in advance of manufacture of the individual mobile home, making it difficult for the mobile home manufacturer to react quickly to demand for different layouts without carrying a large stock of different chassis, which would be uneconomic.

[0004] The complexity of the fabricated chassis tends to be increased by the trend for longer mobile homes and for higher levels of internal equipment, adding weight which tends to cause bending of the chassis about the central wheels. In use, the mobile home will be supported by blocks or the like at or near the axles, so that the wheels are lifted clear of the ground. Similarly, blocks should be used for support at the ends of the chassis. Although corner stays are provided, these tend to be of the screw-brace stay type used in touring caravans, located at the corners of the chassis and having an arm which is pivoted about an axis on the chassis so as to move towards the ground in an arc, and are not intended to provide a permanent support for the ends of the mobile home, although it is known for them to be used in this way. With increasing weight and length of

mobile homes, this is not necessarily the best configuration; it may be desirable to provide support at a position intermediate the wheels and the extremities of the chassis, while the movement of the stay arm in an arc can lead to undesirable forces on the chassis during location of the home.

[0005] In one known form of construction of mobile home, a pair of shaped beams extend the length of the structure, with cross-members extending between the beams. The decking supports are then constructed on the cross-members, again leading to a complex and inflexible arrangement of metal and timber members.

[0006] The present invention seeks to overcome these disadvantages.

Summary of the Invention

[0007] According to one aspect of the invention, there is provided a mobile home comprising first and second beams extending the length thereof and connected by a plurality of cross-members, the beams mounting wheels permitting manoeuvring of the mobile home, decking extending across and connected to the upper surfaces thereof, and a body constructed on the decking.

[0008] Preferably, the decking comprises a plurality of body support members with sheet flooring material attached across the upper surfaces thereof. The sheet flooring materials are suitably wood-based materials such as chipboard or plywood, although metal or other sheeting may be used. In an alternative embodiment, floor panels are attached directly to the upper surfaces of the beams.

[0009] The beams and cross-members are suitably formed of steel. Typically, mild steel will be used, although other materials may be employed, for example stainless steel. Preferably, the cross-members are bolted to the beams, which are suitably I-beams, thereby permitting the beams and the cross-members to be separately galvanised or otherwise treated to prevent corrosion and then assembled in a manner which does not breach the galvanising or other treatment. Similarly, the wheels may be mounted on axles which are bolted to the beams. The axles may be full or stub axles, and a number of alternative mounting positions may be provided along the beams so that, for a given design and internal layout of the mobile home, the wheels may be positioned to achieve a desired nose weight or vertical loading at the towing bracket to facilitate manoeuvring of the vehicle. A single pair of wheels may be sufficient for mobile homes up to a pre-determined weight, while two pairs of wheels may be required for larger homes. The pre-determined weight may depend on local legislation and/or on wheel sizes and convenience of manoeuvring.

[0010] The body support members, which may be formed of steel or of other suitable metal such as aluminium or an alloy thereof, may be attached to the

beams by clamps, so as to permit the position of each to be adjusted according to the desired layout of the components within the body, in particular the plumbing and drainage. In this way, the same basic chassis can be used for a range of different body layouts for any given chassis length.

[0011] The body may be constructed on the body support members by directly attaching decking to the members, and then erecting walls on the decking. Insulation material may be located on the underside of the decking, for example between the body support members. Typically, the walls and roof are constructed as timber frames with external sheeting materials.

[0012] The mobile home according to this aspect of the invention can be made stronger, while reducing the cost of the chassis and affording greater flexibility of layout without the need to stock a wide range of different chassis. Corrosion of the chassis can be significantly reduced. An important advantage is that this design of chassis provides a very flat surface on which the body can be built up, simplifying the construction process. With conventional chassis, it is necessary to build in a "pre-set" or predetermined distortion longitudinally to counteract the distortion which occurs when the weight of the body and its contents act on the chassis. It is very difficult to build in the correct amount of pre-set, and in consequence measures have to be taken to compensate for any discrepancies, for example by deliberately distorting the chassis to attach the body panels. This can lead to stresses being introduced into the structure which can give problems in time.

[0013] According to another aspect of the invention, there is provided a mobile home comprising first and second beams extending the length thereof, each beam mounting at least one wheel generally centrally thereof, the beams supporting a body structure, wherein each beam has a vertically-extendible jack slidably mounted thereon at each side of the wheel or wheels so as to be selectively locatable at a position between the wheel or wheels and the respective end of the beam.

[0014] The jacks may each conveniently comprise a simple screw jack, which may be mounted so as to be pivotable, in addition to being slidable, so as to pivot up to lie along the respective beam during transporting of the mobile home. Alternatively, the jacks may simply be slid off the ends of the beams to be carried separately of the mobile home during transporting thereof.

[0015] A particular advantage of this aspect of the invention is that the mobile home can be levelled and supported on site purely by the jacks, with the wheels lifted clear of the ground, without the need for blocks and the like to be positioned under or near the axles to support the home. Additional jacks may be mounted on the beams, if desired, to provide intermediate support for longer or heavier mobile homes.

[0016] In the mobile home of this aspect of the invention, the positioning of the supporting jacks can be arranged to distribute the load more evenly, reducing the

tendency of the structure to flex in use. The jacks may, for example, be positioned to take account of the internal layout of the mobile home, and this, in conjunction with the use of the two main lengthwise beams, may permit greater flexibility in the internal design of the mobile home, for example avoiding the need to position heavier internal components centrally of the length of the structure.

10 Brief Description of the Drawings

[0017] In the drawings, which illustrate exemplary embodiments of the invention:

15 Figure 1 is a perspective view of a chassis for a mobile home in accordance with one embodiment of the invention;

Figure 2 is an enlarged side view of a portion of one of the main beams of the chassis, showing the attachment of the body support members;

20 Figure 3 is a cross-sectional view on line A-A in Figure 2;

Figure 4 is a perspective view of a detail of the chassis, showing one of the supporting jacks;

25 Figure 5 is a side elevation of a mobile home according to the invention, when installed on a site;

Figure 6 is a view corresponding to that of Figure 1 of a larger embodiment of the invention;

30 Figure 7 is a side elevation of the chassis of Figure 6;

Figure 8 is an enlarged side elevation of a portion of a chassis according to another embodiment of the invention, having the floor attached;

35 Figure 9 is a view corresponding to that of Figure 8, showing an alternative construction;

Figures 10a and 10b are respectively top plan view and side elevation of a chassis according to yet another embodiment of the invention; and

40 Figure 11 is a perspective view corresponding to that of Figure 4, showing an alternative construction of supporting jack.

Detailed Description of the Illustrated Embodiments

45 **[0018]** Referring first to Figure 1, the chassis for a mobile home comprises a parallel pair of steel I-beams 1 and 2 which extend for substantially the full length of the home and are spaced apart by a number of steel cross-members 3 which are bolted through the web of each beam at intervals therealong. The beams 1 and 2 and the cross-members 3 are all galvanised before assembly to protect them from rusting. An axle carrying road wheels 4 for manoeuvring purposes is mounted on the beams 1 and 2, generally centrally thereof. Typically, a pair of wheels is mounted on each beam, although, as may be seen in Figures 6 and 7, larger mobile homes may require two pairs of wheels. At one end of the chassis a towing beam 5 is mounted to carry a towing con-

nector to permit the mobile home to be connected to a towing tractor or the like to facilitate local on-site manoeuvring; it will be appreciated that the mobile home is not designed to be towed for any distance, transport to the site being on a flat-bed truck or trailer.

[0019] To permit the structure of the home to be built up on the chassis, body support members 6 are mounted across the upper flanges 7 of the two I-beams 1 and 2, as shown in Figures 2 and 3. The body support members 6 are conveniently in the form of square channel members of steel or aluminium, which are attached to the upper flanges 7 by means of screw clamps 8 on the underside of each member 6. The channel members can be replaced with box-section members, if desired. This method of construction avoids the need for welding, which could adversely affect the integrity of the galvanising coating, and permits the body support members 6 to be readily adjusted in position to suit the layout of the mobile home, for example to take into account the routing of water supply pipes and drain pipes under the mobile home floor. Wooden decking 9 is then laid across the body support members 6 and fixed to them by means of screws 10. The decking 9 may be, for example, wood chip board or plywood, and insulating material may be attached to the underside thereof between, or continuously over, the members 6 to reduce heat loss through the floor of the home in use. The remainder of the structure of the mobile home may then be constructed on the floor in conventional manner, for example using timber frames infilled with insulating material and clad on the outside with weather-proofing cladding such as coated aluminium sheet or pre-formed plastics cladding, and on the inside with wall boards which can be decorated by painting, papering or other finishing materials. Such structures are well-known in the mobile home and caravan industries and do not need to be described here in further detail.

[0020] Figures 4 illustrates a support jack for supporting the chassis of the mobile home on site. Each jack 12 consists of a mounting 13 which is a sliding fit on to the lower flange 14 of one of the I-beams 1 and 2, and a screw leg 15 carried beneath the mounting 13 and having a reversible ratchet lever 16 by which the leg 15 may be rotated to the desired extension. As may be seen from Figure 5, the jacks 12 are positioned inwardly of the ends of the beams at a position chosen by the installer, or specified by the manufacturer, to ensure the optimum distribution of the weight of the mobile home, and support the mobile home with the wheels clear of the ground without the need for blocks or other built-up supports. Installation and levelling of the mobile home is therefore greatly simplified.

[0021] Figures 6 and 7 illustrate another embodiment of the invention where a greater length of mobile home is to be constructed. The chassis comprises, in addition to the two main longitudinal beams 1 and 2, secondary beams 61 and 62 which extend beneath a central portion of each main beam 1 and 2 and which are provided

with cross-members 63 and 64 connecting them together at the ends thereof. The wheels 4 are mounted on the secondary beams 61 and 62. This arrangement affords additional rigidity for longer chassis, while having the additional advantage of elevating the main beams 1 and 2 by a small distance, giving additional ground clearance for manoeuvring of the mobile home on site, which is desirable where the mobile home is of greater length and the ground is not level.

[0022] In the chassis illustrated in Figure 8, the floor supporting members 80 are channel-shaped with sloping sides 81 and horizontal flanges 82 extending outwardly from the upper edges thereof, and are suitably formed from pressed metal sheet, for example steel or aluminium alloy. The members 80 are carried on the main beams 1 by saddles 83 shaped to receive the lower parts thereof and provided with screw clamps 84 to engage the flanges 7 of the main beams 1. This permits the saddles 83 to be positioned and adjusted according to the desired positions of the floor supporting members, enabling in turn the locations of the members 80 to be varied to accommodate, for example, bathroom drainage. In this way, the internal layout of the home may be varied without the need to redesign the chassis. The members 80 are fixed in the saddles by means of screws 84, for example self-tapping screws. Blocks of insulating material 85, for example expanded polystyrene, which is light, has a low thermal conductivity and is water-resistant, may be located between the members 80 on top of the beams 1. This may be achieved by putting the blocks 85 in place before the members 80 are secured in the saddles 83, so that the flanges 82 serve to hold the blocks in place. Additional insulation material may be located in the members 80.

[0023] Flooring 86, for example sheets of chipboard or plywood, is laid on to the members 80 and the blocks 85 and secured in place using screws, again suitably self-tapping screws, engaging in the flanges 82 of the floor supporting members 80. The resulting floor is rigid and stable, while being relatively light in weight and affording a high degree of thermal insulation.

[0024] The construction illustrated in Figure 9 employs pre-formed composite flooring units based on corrugated metal sheeting 90, suitably coated pressed steel of the general type used in the cladding of industrial buildings. The corrugations 91 may be of a truncated V-shape in section, as illustrated, or may be more rectangular, but the precise shape is not important. Insulating material 92, suitably expanded polystyrene blocks, is located between the corrugations 91 and is attached to the sheeting 90 by means of adhesive. Flooring material 93 such as chipboard or the like is then secured to the upper face of the sheeting 90 to form a laminate flooring unit. The flooring material may be secured by means of screws 94, as illustrated, but it may preferably be attached by adhesive. The flooring units may then be attached to the upper surfaces of the beams 1 of the chassis by means of saddles as illustrated in, and described

with reference to, Figure 8.

[0025] Figures 10a and 10b show an alternative configuration of chassis, in which the side members 100 are fabricated beams having a central section 101 of greater depth than the remainder, the axle/wheel unit 102 being mounted centrally of the central section 101. Such a configuration confers greater rigidity on the chassis, and permits the number of cross-members 103 to be significantly reduced, saving on weight. The jacks 104 are slidably mounted on the end portions 105 of the chassis. In Figure 10a they are shown folded up against the chassis to facilitate transport of the vehicle.

[0026] Figure 11 shows an alternative form of jack, having a mounting 110 which slidably engages the lower flange 14 of the main beam 1 or of the end portion 105 of the main beam as the case may be. The mounting 110 carries on the underside thereof a pivot 111, to which is attached the leg 112, the upper end of which is provided with an eye alignable with an eye on the mounting 110 to receive a locking pin 113 to hold the eyes together, thereby securing the leg in its operative position as illustrated. The lower end of the leg 112 has a rotatable captive screw nut 114 through which passes a threaded bar 115 carrying a steel plate 116 to engage the ground and carry the weight of the mobile home, when on site. The nut 114 is provided with apertures 117 to receive a tool for rotating the nut to raise or lower the jack. A chain 118 is provided to permit the jack to be held in the folded position against the chassis side member when the vehicle is being transported.

6. A mobile home according to Claim 2, wherein the body support members are attached to the beams by clamps, whereby the position of the body support members may be adjusted according to the desired layout of the components within the body.

7. A mobile home comprising first and second beams extending the length thereof, each beam mounting at least one wheel generally centrally thereof, the beams supporting a body structure, wherein each beam has a vertically-extendible jack slidably mounted thereon at each side of the wheel or wheels so as to be selectively locatable at a position between the wheel or wheels and the respective end of the beam.

8. A mobile home according to Claim 7, wherein each jack comprises a simple screw jack.

9. A mobile home according to Claim 7 or 8, wherein each jack is mounted so as to be pivotable, in addition to being slidable, so as to pivot up to lie along the respective beam during transporting of the mobile home.

Claims

1. A mobile home comprising first and second beams extending the length thereof and connected by a plurality of cross-members, the beams mounting wheels permitting manoeuvring of the mobile home, decking extending across and connected to the upper surfaces of the beams, and a body constructed on the decking.

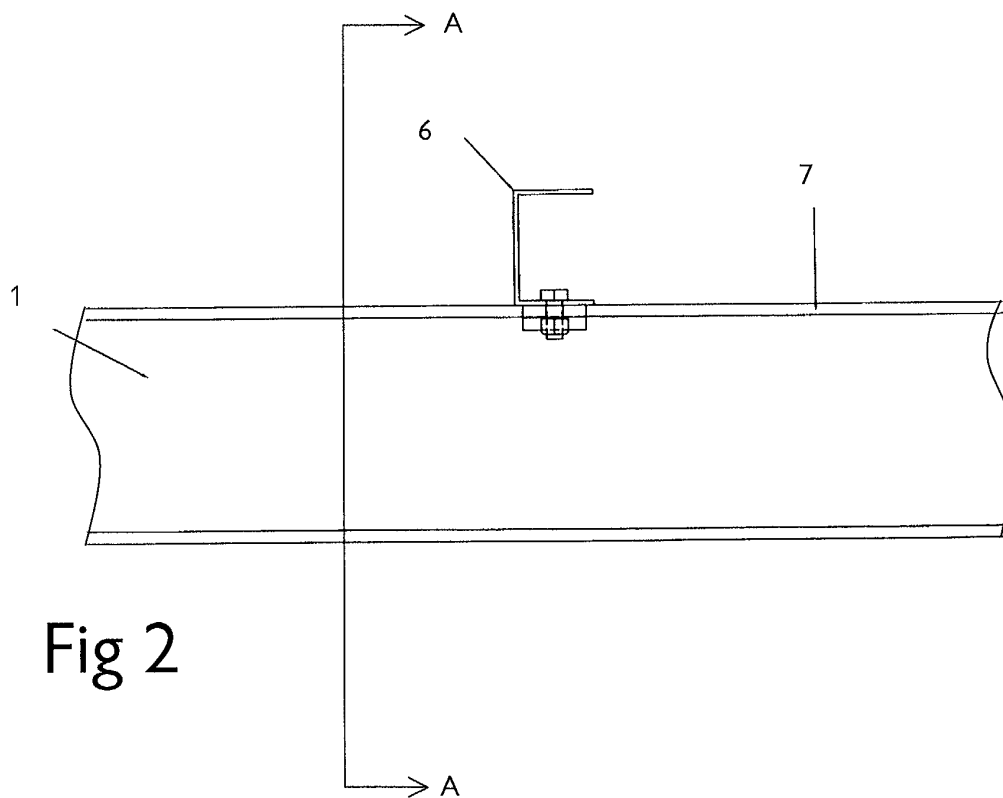
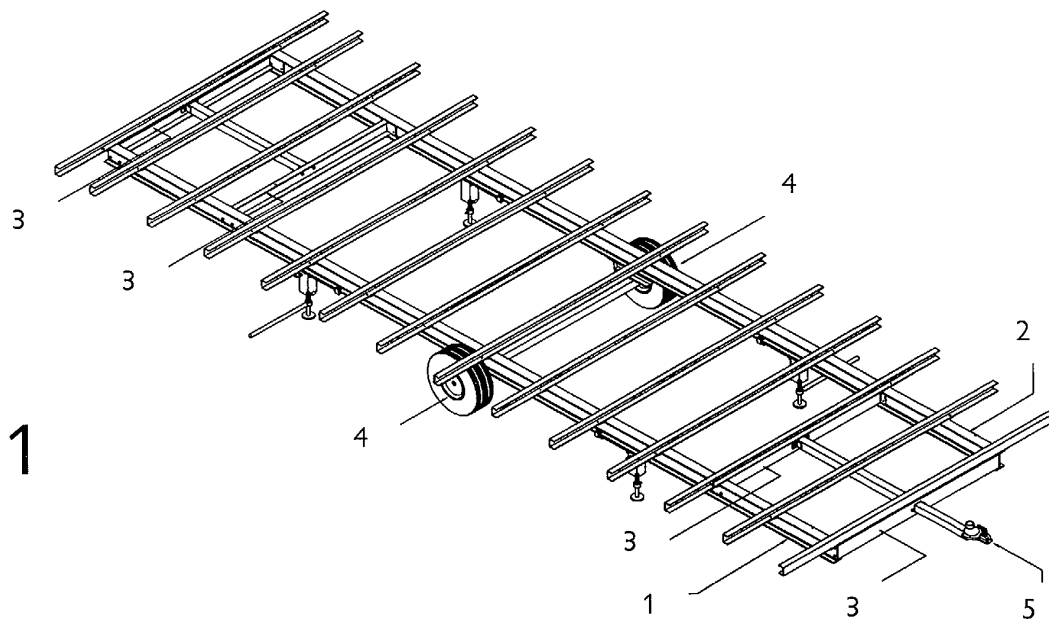
2. A mobile home according to Claim 1, wherein the decking comprises a plurality of body support members with sheet flooring material attached across the upper surfaces thereof.

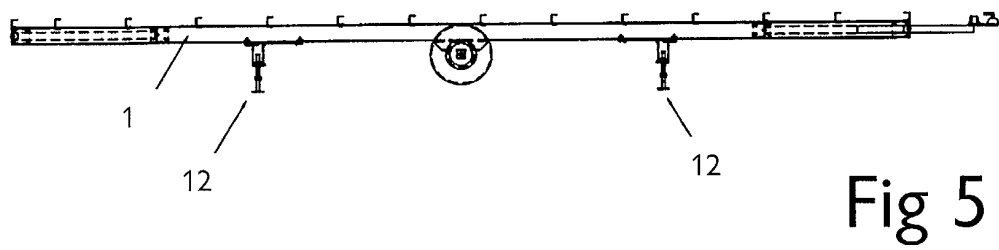
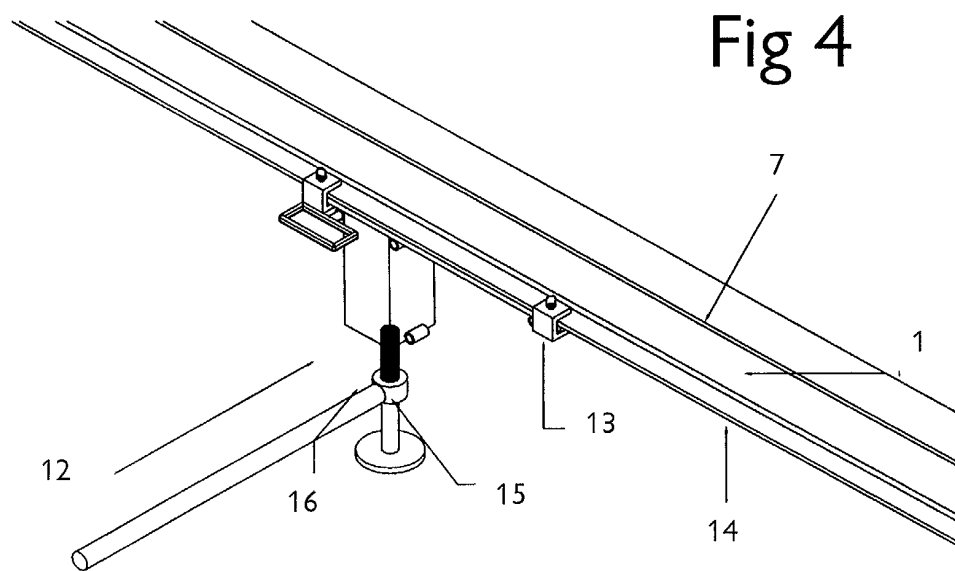
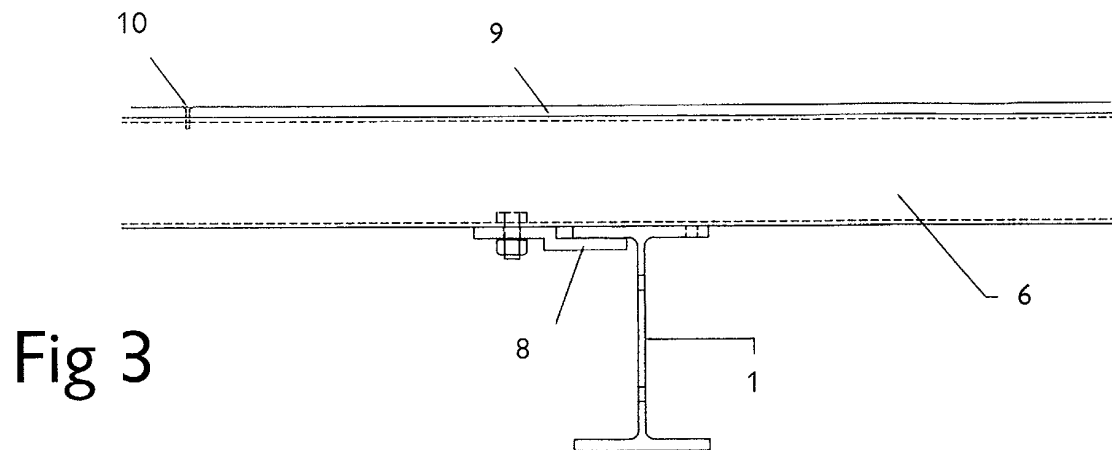
3. A mobile home according to Claim 1, wherein the decking comprises floor panels attached directly to the upper surfaces of the beams.

4. A mobile home according to Claim 2 or 3, wherein the sheet flooring materials are wood-based materials such as chipboard or plywood.

5. A mobile home according to Claim 2 or 3, wherein the sheet flooring materials comprise metal.

Fig 1





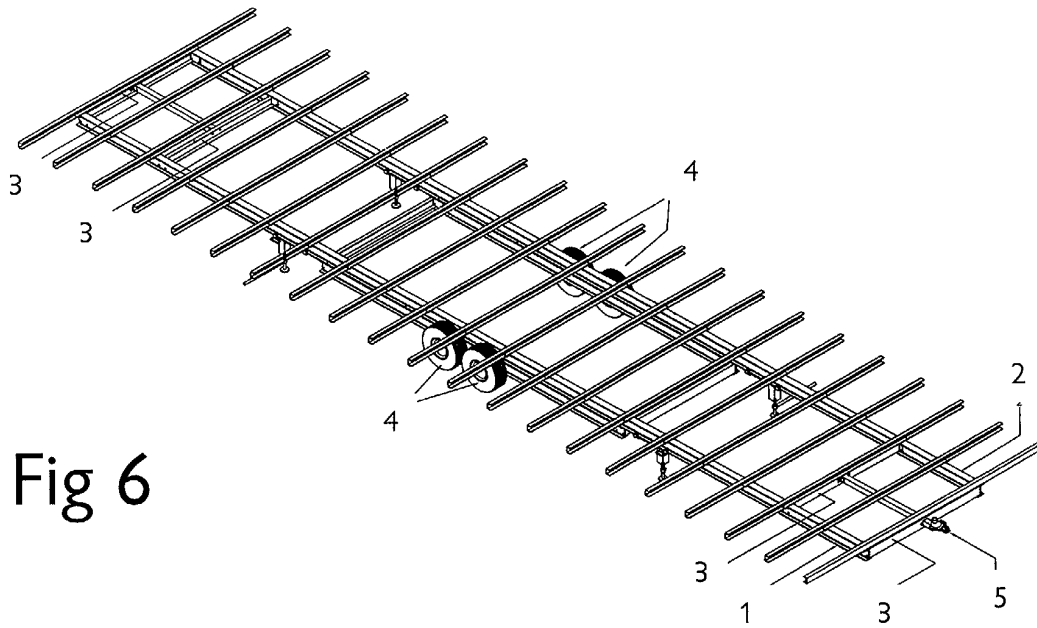


Fig 6

Fig 7

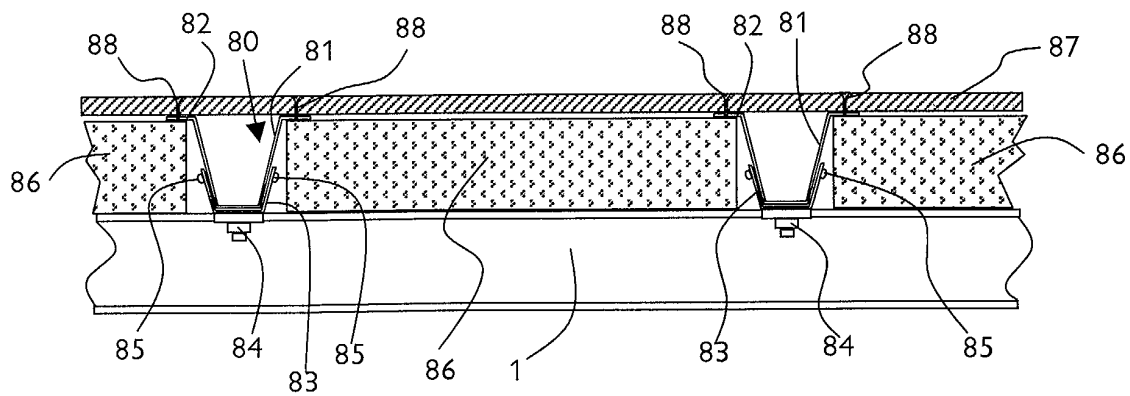
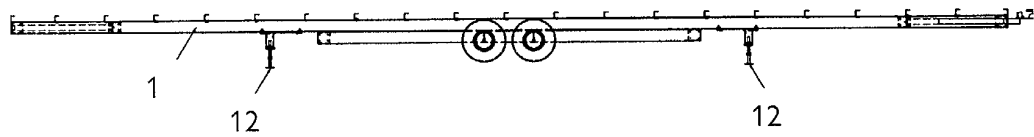


Fig 8

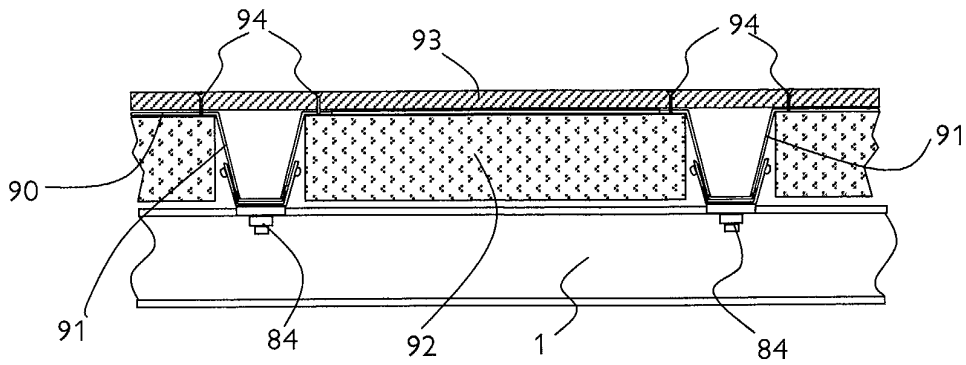


Fig 9

Fig 10a

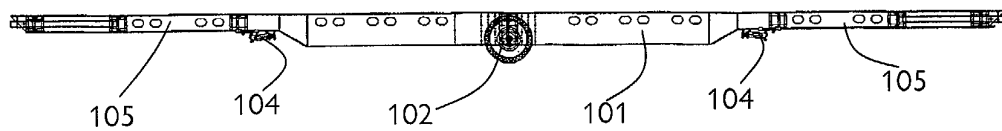
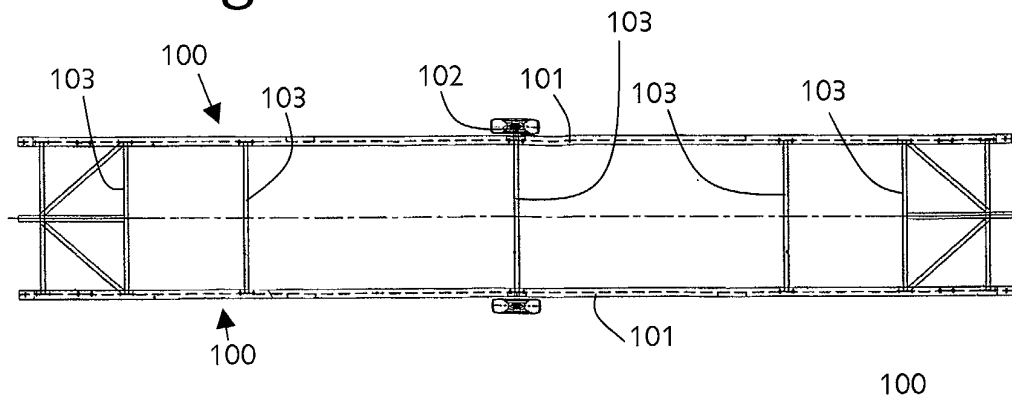


Fig 10b

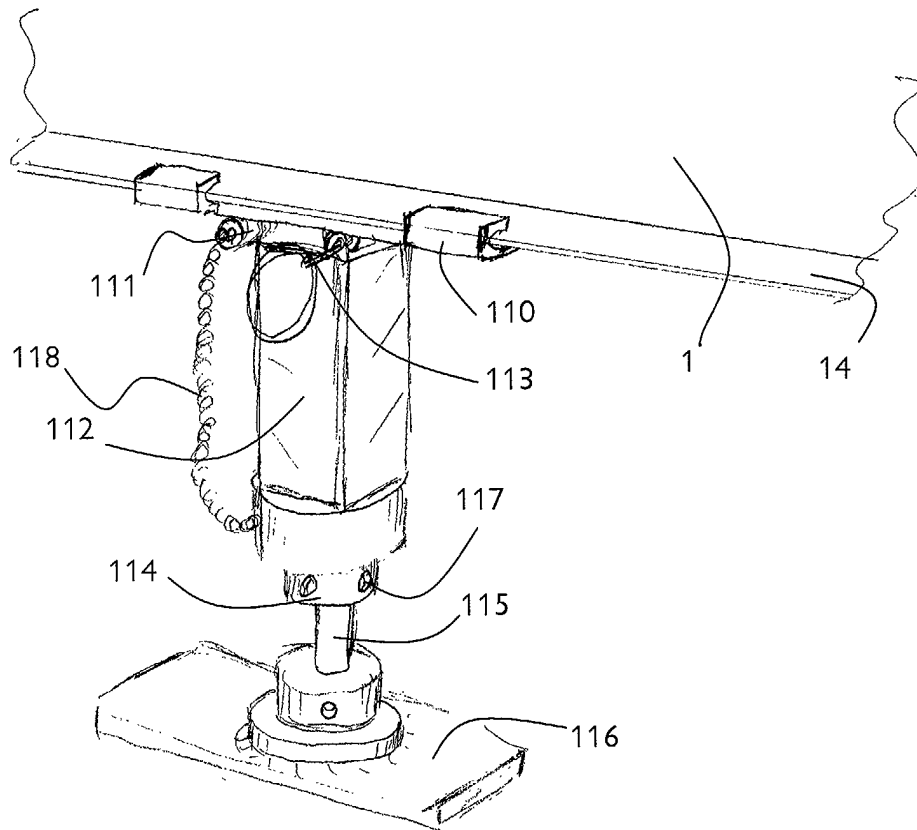


Fig 11