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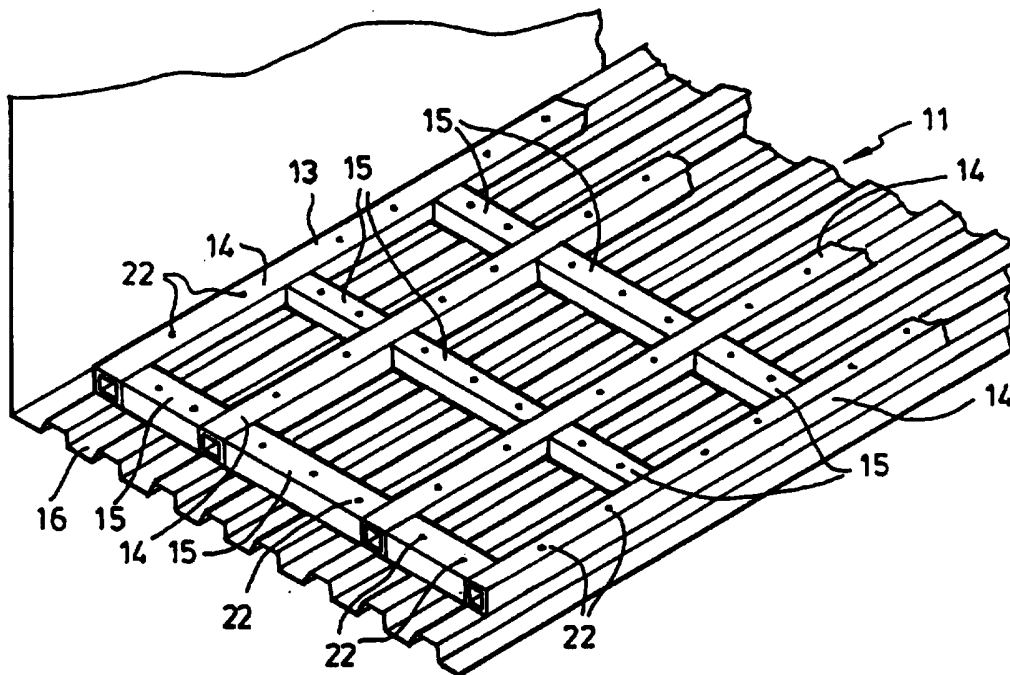
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(54) Title: SEAT ANCHORAGE ARRANGEMENTS



(57) Abstract

There is disclosed an anchorage arrangement for vehicular seating comprising a framework of longerons secured to transversely extending members said framework being secured to the vehicle floor and the longerons affording forward and rearward anchorage points for forward and rearward base member fastening points of seating the longerons extending forwardly of the forward anchoring points of the seating.

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SEAT ANCHORAGE ARRANGEMENTS

This invention relates to seat anchorage arrangements for public service vehicles and especially for minibus-type vehicles usually adapted for passenger-carrying from light goods vans.

A number of accidents, some involving school-children, have prompted calls for passenger restraint to be fitted to such vehicles, and the lap-diagonal car seat belt is the most obvious selection from those currently available. Concerns have been expressed about the effectiveness of such an arrangement. In the first place, the seating conventionally fitted in such vehicles is not adapted for such belt arrangements and anchoring points need to be provided for the belts and associated mechanism, which adds considerably to the cost involved and which may be difficult to install in a satisfactory manner because of the vehicle configuration. Secondly, however, conventional seating for this type of vehicle is of relatively flimsy construction capable of bearing the ordinary weight of a passenger in regular driving conditions, but not designed to withstand forces experienced in collisions, so that restraint in a seat which is itself collapsing is as liable to lead to injury as lack of any restraint at all.

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The present invention provides anchorage arrangements for vehicle seating that provide a ready and relatively inexpensive installation which has nonetheless inherently safer characteristics than conventional seating installations in vehicles of the minibus type.

The invention comprises an anchorage arrangement for vehicular seating comprising a framework of longerons secured to transversely extending members said framework being secured to the vehicle floor and the longerons affording forward and rearward anchorage points for forward and rearward base member fastening points of seating, the longerons extending forwardly of the forward anchorage points of the seating.

The longerons and transverse members may be welded together. At least the longerons may be of rectangular section tube stock.

The framework may be comprised in steel or a material of like strength and rigidity.

The framework may be bolted to the vehicle floor.

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The seating may have base member fastening points either side of a seat, adapted for bolting to the longerons.

The seats themselves may comprise rigid base frames designed to test when fixed to a rigid support to a 10 g head-on collision or, preferably, and to meet particular requirements, a 20 g collision. The seats and framework may be designed, constructed and assembled to test when installed in a vehicle to a 10 g head-on collision or, again, preferably, a 20 g collision.

The seats may comprise passenger restraint means, which may comprise lap diagonal seat belts secured to the seat.

Embodiments of an anchorage arrangement according to the invention will now be described with reference to the accompanying drawings, in which :-

Figure 1 is a perspective view of part of a framework of an anchorage arrangement attached to a vehicle floor;

Figure 2 is a plan view of an anchorage arrangement;

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Figure 3 is a side elevation of a seat mounted on an anchoring arrangement; and Figure 4 is a front elevation of the seat illustrated in Figure 3, so mounted.

The drawings illustrate anchorage arrangements 11 for vehicular seating 12 comprising a framework 13 of longerons 14 secured - by welding - to transversely extending members 15, said framework being secured to the vehicle floor 16 and the longerons 14 affording forward (17) and rearward (18) anchoring points for forward (19) and rearward (21) base member fastening points of seating 12, the longerons 14 extending forwardly of the forward anchorage points 17 of the seating 12.

The longerons 14 and the transverse members 15 are of rectangular section steel tube stock, typically 30 mm x 50 mm in 3 mm thick steel, although 90 x 50 x 3 could be used instead, giving extra strength and rigidity.

The framework 13 may comprise a single frame extending over the entire floor of a vehicle or substantially so, or it may be made in smaller sections to cover only a part of the floor if limited seating is required. In any event, the framework 13 is capable of

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prefabrication and is easily installed in and removed from a vehicle.

While, in the drawings, the longerons have been shown as continuous while the transverse members are in short sections, it could be that the transverse members are continuous, the longerons being sectioned. Or a framework could be made in which some of the longerons are continuous and some of the transverse members are continuous.

The framework 13 is bolted to the floor 16, bolts 22 being positioned where the structure of the floor permits. A prefabricated framework 13 intended for a specific make and model of vehicle can be pre-drilled in suitable places for further ease of installation. For a retro-fit, the vehicle floor 16 would need to be drilled - the framework 13 itself could be used to mark the drilling points or a template supplied. Fixing is by any convenient method which will give firm anchorage that will not work loose.

The seating 12, illustrated in Figures 3 and 4, has base member 23 fastening points 24 either side of a seat, adapted for bolting to the longerons 14, as by pre-drilled holes mating with pre-drilled holes in the longerons 14.

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Ideally, the seating 12 comprises rigid base frames 12A designed to test when fixed (as by the bolts normally used for installation in a vehicle) to a rigid support (i.e. the framework or a support simulating the framework) to a 10 g head-on collision. Likewise, the seats and the framework, in combination, can be designed, constructed and assembled to test when installed in a vehicle to a 10 g head-on collision. Preferably, and to meet some requirements, they will test to a 20 g head-on collision.

A seat back support 12B and seat pan 12C can be upholstered or fitted with cushioning in the usual way.

The seats provide further appropriate anchorage (not illustrated) for passenger restraint means, typically seat belts, which may be of the lap diagonal type.

Generally, the seat anchorage arrangement described and illustrated, together with the stronger seating, provides for substantially improved passenger safety. This is achieved together with enhanced rigidity of the vehicle due to the presence of the rigidifying framework. The framework is easily installed and removed for altering the vehicle's purpose, and there is no limitation on the flexibility

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of the vehicle as regards different seating and load-carrying arrangements.

The arrangements are also useful on larger vehicles such as coaches.

While the arrangements have been described and illustrated in terms of forward-facing seating, it is also possible to have rearwardly-facing seating, the forward extension of the longerons with respect to the seating being considered to be in the forward direction of the vehicle, regardless of the direction the seats face.

While, also, the arrangements have been described as a retro-fit, it would clearly be possible to incorporate a framework as described in a vehicle on original equipment, when it would also be possible to locate the framework beneath the floor. Inasmuch as extending the longerons forward of the seating gives added protection against the seating tipping forwardly, as a skier cannot fall forwards, it might be advantageous, with a floor skin above the framework, to extend the framework rearwardly.

A floor skin, especially when made of a material which is, at least over a length commensurate

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with a seat, essentially rigid against flexure, such as a honeycomb composite panel, can be regarded as an integral framework with filled-in panels, so that instead of building a framework from tube stock a single panel of such material can be placed and secured to the vehicle floor, the placement of the fixing bolts or the like corresponding to the notional framework layout in the panel.

CLAIMS

1. An anchorage arrangement for vehicular seating comprising a framework of longerons secured to transversely extending members said framework being secured to the vehicle floor and the longerons affording forward and rearward anchorage points for forward and rearward base member fastening points of seating the longerons extending forwardly of the forward anchoring points of the seating.
2. An arrangement according to claim 1, in which the longerons and transverse members are welded together.
3. An arrangement according to claim 1 or claim 2, in which at least the longerons are of rectangular section tube stock.
4. An arrangement according to any one of claims 1 to 3, in which the framework is comprised in steel or a material of like strength and rigidity.
5. An arrangement according to any one of claims 1 to 4, in which the framework is bolted to the vehicle floor.
6. An arrangement according to any one of claims 1 to 5, in which the seating has base member fastening points either side of a seat, adapted for bolting to the longerons.

7. An arrangement according to any one of claims 1 to 6, in which the seats comprise rigid base frames designed to test when fixed to a rigid support to a 10 g head-on collision.

8. An arrangement according to any one of claims 1 to 7, in which the seats and framework are designed constructed and assembled to test when installed in a vehicle to a 10 g head-on collision.

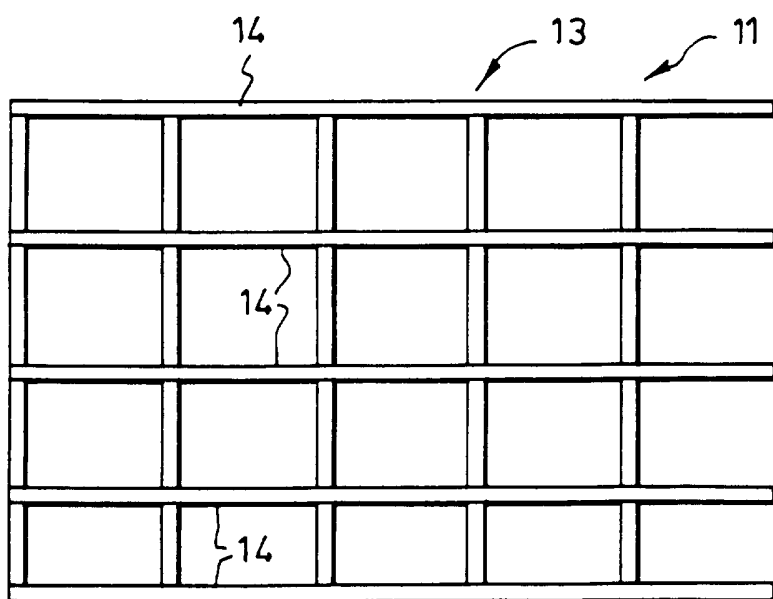
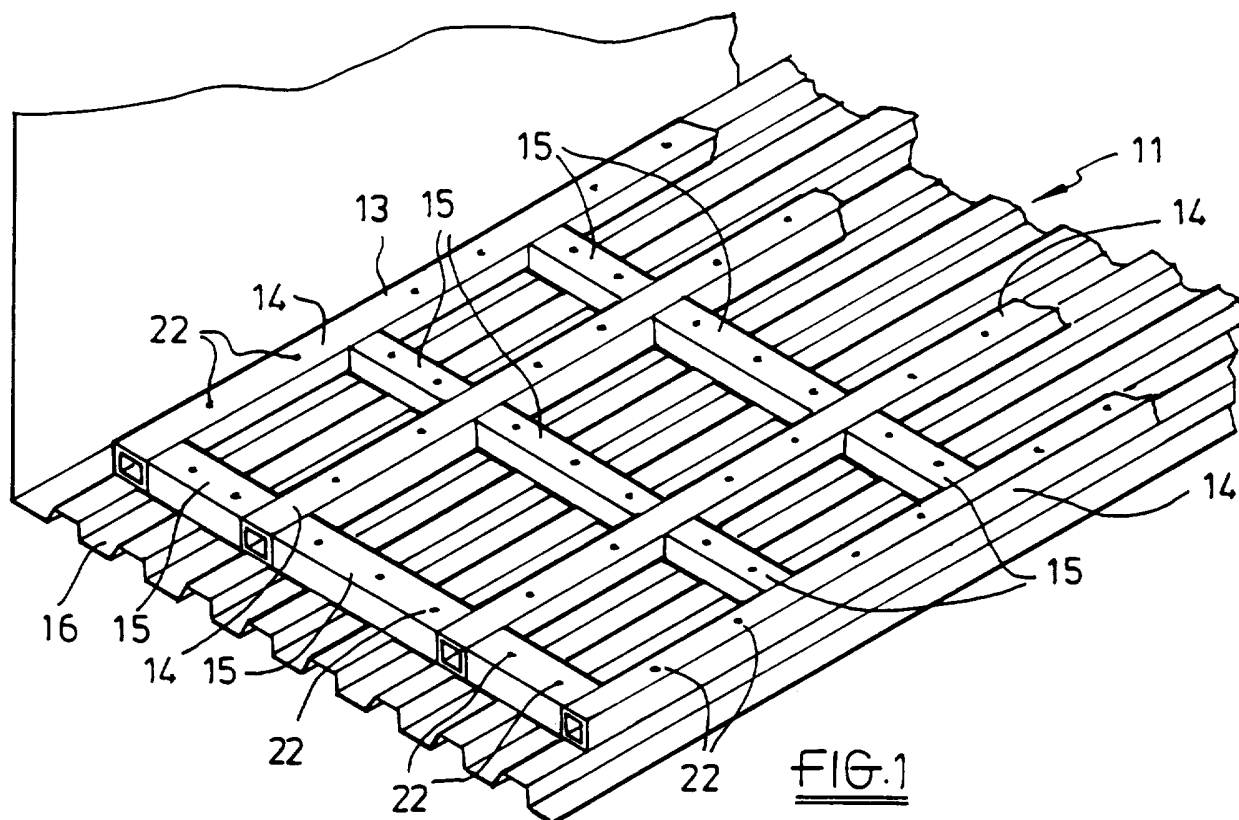
9. An arrangement according to any one of claims 1 to 8, the seats comprising passenger restraint means.

10. An arrangement according to claim 9, said restraint means comprising lap diagonal seat belts secured to the seat base.

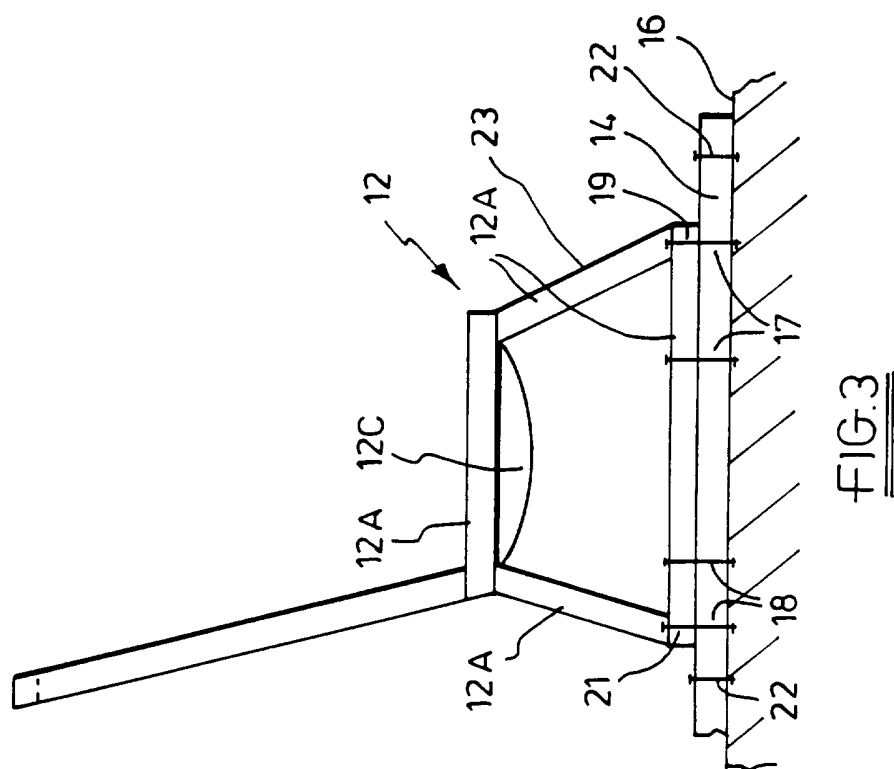
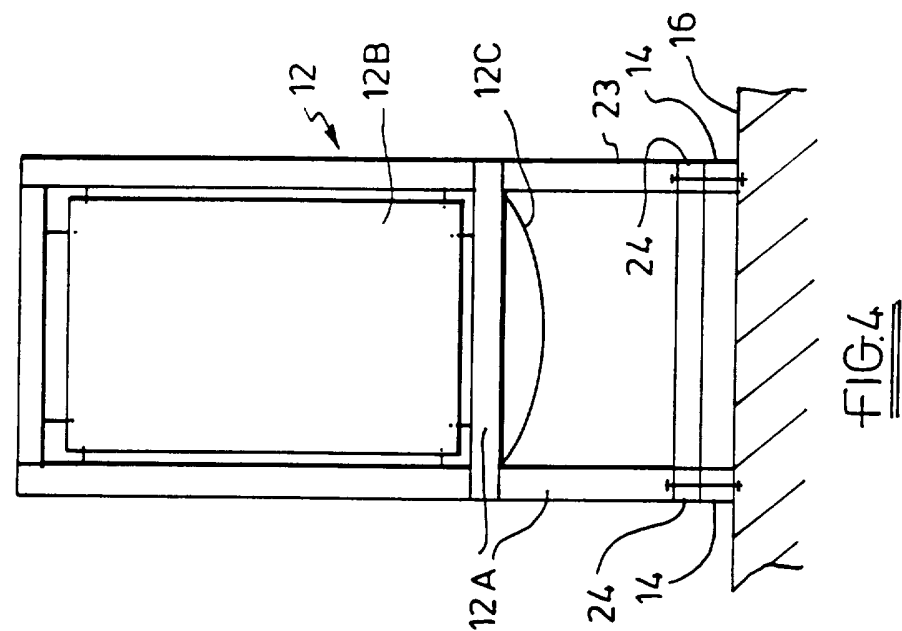
11. An arrangement according to any one of claims 1 to 10, in which the framework is a notional framework comprised in a panel of material which is essentially rigid against flexure over a length commensurate with a seat, the placement of fixing bolts or the like corresponding to the notional framework in the panel.

12. An arrangement according to claim 11, in which the panel is a honeycomb composite panel.

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/GB 95/01404

A. CLASSIFICATION OF SUBJECT MATTER
 IPC 6 B60N2/00 B62D21/02

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)

IPC 6 B60N B62D B60R

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 practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP,A,0 566 528 (ALUSUISSE-LONZA SERVICES AG) 20 October 1993 see column 3, line 43 - column 5, line 31; figures 1-16 ---	1
A	EP,A,0 248 127 (HOCKNEY PTY LIMITED) 9 December 1987 ---	
A	US,A,1 692 603 (EDDY R. WHITNEY) 20 November 1928 ---	
A	US,A,4 863 189 (FRED LINDSAY) 5 September 1989 ---	
A	FR,A,844 905 (VEREINIGTE OBERSCHLESISCHE HUTTENWERKE, A. G.) 4 August 1939 -----	

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Patent family members are listed in annex.

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Date of the actual completion of the international search

1 September 1995

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Information on patent family members

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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