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(54) **Seating arrangement and assembly**

(57) The invention relates to a kit of parts for constructing a seating arrangement. The kit comprises a seating portion (70), a floor portion (40, 50) and a support structure (12) for supporting both the seating portion (70) and the floor portion (40, 50) when the kit of parts is assembled. The seating portion (70), floor portion (40, 50) and support structure (12) are adapted so that the floor portion (50) is anchored to the support structure (12) by the seating portion (70).

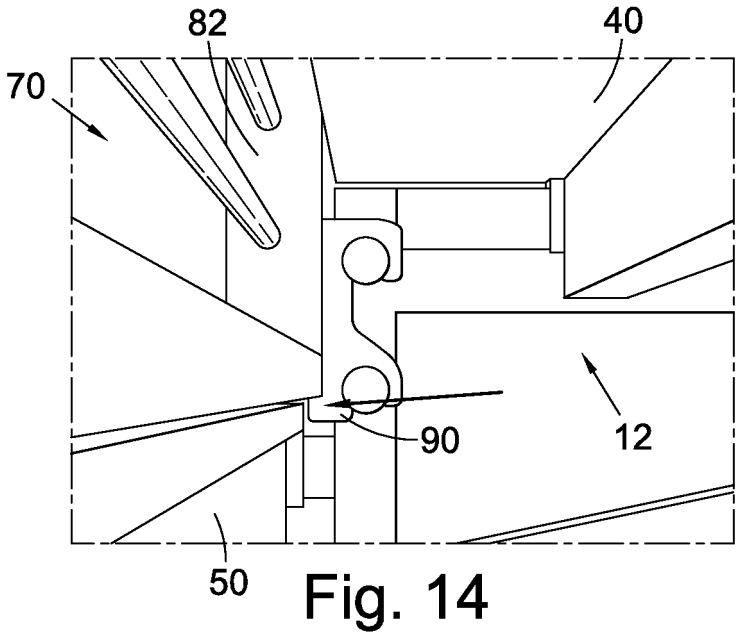

Fig. 14

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Description

FIELD OF EMBODIMENTS OF THE INVENTION

[0001] Embodiments of the invention relate to a kit of parts for a seating arrangement and methods of assembling a seating arrangement. In particular, embodiments of the invention concern temporary seating arrangements.

BACKGROUND

[0002] The erection of seating arrangements, in particular temporary seating arrangements, can occur under time pressure which can increase the risk of accidents occurring. Furthermore, such arrangements are usually raked so that at least a portion of the arrangement is located at a significant height above ground.

[0003] The greater the height of a working environment, the more dangerous that working environment is. Not only is the risk of injury due to a fall increased, but the increased height also increases wind speed where the installation occurs outdoors, thereby increasing the potential risk of the working environment. Therefore, the work involved in erecting such arrangements can be perilous.

[0004] In the United Kingdom there has recently been a legal requirement to provide a safer working environment where this environment is elevated (Work at Height Regulations 2007).

SUMMARY

[0005] According to an embodiment of the invention, a kit of parts for constructing a seating arrangement is provided, the kit of parts comprises a seating portion, a floor portion and a support structure for supporting both the seating portion and the floor portion when the kit of parts is assembled, wherein the seating portion, floor portion and support structure are adapted so that the floor portion is anchored to the support structure by the seating portion.

[0006] By having the seating portion anchor the floor portion to the support structure, there is a good motivation, during construction of the kit of parts, to install the floor portion before installing the seating portion. The floor portion provides a far safer working environment than the support structure on its own, particularly when at height. Therefore, embodiments of the invention provide a safer working environment during assembly of the kit of parts.

[0007] The floor portion and the support structure may be adapted so that the floor portion slides relative to the support structure and, in this case, the seating portion may be adapted to anchor the floor portion relative to the support structure when the seating portion and the floor portion are installed. The anchoring may prevent movement of the floor portion in the sliding direction. In further embodiments, the anchoring prevents movement in other directions too.

[0008] The support structure may comprise a lip configured to engage with the floor portion and to anchor the floor portion when installed. In this embodiment, the sliding motion of the floor portion relative to the support structure during installation may cause the floor portion to engage with the support structure.

[0009] The seating portion may comprise an abutment which engages with the floor portion when the floor portion and the seating portion are installed to prevent sliding motion of the floor portion relative to the support structure. In this instance, the floor portion may comprise a complimentary structure which engages with the abutment to prevent this movement.

[0010] The kit of parts may comprise a plurality of seating portions and floor portions, wherein the support structure is arranged to support the plurality of seating and floor portions in a tiered arrangement.

[0011] According to this embodiment, the tiered arrangement in conjunction with the seating portion anchoring the floor portion to the support structure may encourage the installation of the kit of parts in an ordered fashion whereby floor portions are installed prior to seating portions. Therefore, a floor portion is always provided so that the personnel installing the kit of parts have a platform upon which to stand and install subsequent portions, thereby significantly decreasing the risk of the work.

[0012] The support structure may be modular comprising two or more units, each unit supporting seating portions arranged at different rakes. This allows the seating portions to be arranged at different inclines which, in turn, provides for a combined seating which is easy to install and provides optimum viewing for the inhabitants of all of the seats. Preferably, the rakes of the supported seating portions increase with height relative to the ground.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Example embodiments of the invention are hereinafter described with reference to the accompanying diagrams which are not to scale and where:

Figure 1 illustrates a unit for a support structure according to a first embodiment of the invention;
Figure 2 illustrates a portion of the unit illustrated in Figure 1;
Figure 3 illustrates a detail of Figure 2;
Figure 4 illustrates two floor portions according to an embodiment of the invention;
Figure 5 illustrates a detail of Figure 4;
Figure 6 illustrates a seating portion according to an embodiment of the invention;
Figure 7 illustrates three floor portions installed in the unit for a support structure illustrated in Figure 1;
Figure 8 illustrates three seating portions installed on the structure shown in Figure 7; and
Figures 9 to 14 illustrate the attachment of a seating

portion to a support structure according to an embodiment of the invention.

DESCRIPTION OF EXAMPLE EMBODIMENTS

[0014] An embodiment of the invention will now be described with reference to the accompanying drawings which are schematic in nature.

[0015] Figure 1 illustrates a modular part 10 for a support structure according to a first embodiment of the invention. The modular part 10 comprises a first unit 12 and a second unit 14. The units 12 and 14 are mounted on a scaffolding 20 which includes a number of crossbars, risers etc in a manner known in the art.

[0016] Unit 12 is illustrated in greater detail in Figure 2. As illustrated in this Figure, the unit 12 comprises three U-shaped bars 22, 24 and 26, each of which are supported by structural elements including a unit support beam 30. The "U" of each bar forms a corresponding channel. When the unit 12 is mounted on the scaffolding 20 the unit 12 is orientated so that U-shaped bars 22, 24 and 26 are substantially horizontal relative to the ground. Therefore, the rake of the seating installed will be defined by the angle between the U-shaped bars 22, 24 and 26 and the support beam 30.

[0017] The three U-shaped bars 22, 24 and 26 define corresponding supports for floor portions, as described in further detail below. Therefore, the structure illustrated in Figure 2 is similar for each of these U-shaped bars. Dashed portion 27 roughly delineates the portion corresponding to U-shaped bar 26. As illustrated in Figure 2, U-shaped bar 26 is attached to various supporting bars, one of which, bar 31, rises above (with reference to a ground level when the unit 12 is installed) the U shaped bar 26. Bar 31 further comprises four pegs 28a, 28b, 28c and 28d. Furthermore a lip 29 is attached to bar 31 and orientated over the channel formed in U-shaped bar 26. In this embodiment, U-shaped bar 26, bar 31 and pegs 28a, 28b, 28c and 28d form a support structure.

[0018] Figure 3 illustrates the pegs 28a, 28b, 28c and 28d, the bar 31, as well as U-shaped bar 26 and bar 31 in greater detail.

[0019] Figure 4 illustrates to floor portions 40 and 50. The floor portion 50 includes reinforcing bars 52 and 54 as well as catches 56 and 58 located on one side thereof. Floor portion 50 further includes two further catches, shaped and orientated in a manner similar to catches 56 and 58, located on the opposing side. Floor portion 40 includes similar reinforcing bars and catches, but these are not described in detail.

[0020] Figure 5 illustrates a detail of Figure 4 showing the catch 58 of floor portion 50. The catch 58 includes an abutment 60 shaped as a hook. The catch 58 is shaped in a U-shape so that the part thereof corresponding to the abutment 60 may be located in the channel of U-shaped bars 22, 24 or 26. In this manner, the U-shaped bars provide a guide so that the floor portions can be installed with a sliding motion relative to the support structure.

[0021] Figure 6 illustrates a seating portion 70 comprising five seats 72, 74, 76, 78 and 80. The seats are installed on supporting truss 82 which includes an endplate 84. The truss 82 includes a further endplate located at the opposite side to endplate 84, but which is barely visible in Figure 6. The endplate 84 comprises hooks 86 and 88, and abutment 90.

[0022] Figure 7 illustrates the floor portions 40 and 50, as well as floor portion 92. With reference to floor portion 50, this is inserted by locating the catches 58 and 56 in the channel formed by U-shaped bar 26 (Figure 2), as well as locating corresponding catches on the opposite side of the floor portion 50 in a further U-shaped bar provided at that side, and sliding the floor portion in the direction of arrow 94 illustrated in Figure 7 until the floor portion 50 abuts bar 31. In this configuration, the floor portion 50 will be covered by lip 29 which serves to prevent lifting of the floor portion 50 relative to the support structure.

[0023] Figure 8 illustrates seating portions 70, 100 and 110 installed on the structure illustrated in Figure 7. With reference to seating portion 70, this is installed by having the hooks 86 and 88 of endplate 84 (Figure 6) engage with the pegs 28a and 28b of portion 27 of unit 12 (Figure 2).

[0024] Therefore, each seating portion helps to ensure that the corresponding floor portion is retained in place once the seating portion has been installed. The weight and design of the seating portion will ensure that the abutment 90 of endplate 84 (with reference to the seating and floor portions illustrated in the Figures and described above, for example) acts against a rear external surface of the corresponding floor portion. This helps to ensure that the floor portion maintains engagement with lip 29. The lip 29 prevents the floor portion from lifting, thereby protecting the floor portion from movement due to winds or other forces. Furthermore, for all but the lowermost floor portions, the next succeeding seating portion will act to anchor the front of the floor portion to the support structure, thereby further securing the structure against movement due to winds, or during use.

[0025] A significant advantage of embodiments of the invention is that because the floor portions are retained in place by their corresponding seating portions, the easiest manner to install an arrangement which comprises a plurality of floor portions and seating portions arranged in successive rows of increasing height (such as those illustrated in the drawings and described above) is to install a floor portion and then install the seating portion which retains that floor portion in place. When the floor portion is first installed and retained in portion by lip 29, this provides a natural platform for the personnel installing the arrangement to stand on to install the corresponding seating arrangement. With the arrangement such as that illustrated in Figure 7, a number of floor portions can be installed before the corresponding seating portions are installed. However, with this arrangement too, the

floor portions provide support for personnel while the remaining parts of the arrangement are installed.

[0026] Figures 9 to 14 illustrate the attachment of a seating portion to a support structure according to an embodiment of the invention. Figure 9 illustrates a detail of the arrangement illustrated in Figure 8. As illustrated in Figure 9, seating portions 40 and 50 are engaged with support structure 12. The lip 29 prevents floor portion 50 from moving upwards (in the direction of the Figure illustrated). This prevents that floor portion from being lifted by the wind, for example. A similar arrangement retains floor portion 40 in place.

[0027] Also illustrated in Figure 9 are the pegs 28c and 28d attached to bar 31 of support structure 12.

[0028] Figure 10 illustrates the seating portion 70 being brought into engagement with the support structure 12. The hooks 86 and 88 of seating portion 70 are configured so that the seating portion must be lifted (relative to the support structure) to be installed (the hooks 86 and 88 engage with the pegs 28c and 28d and can only engage with the pegs if the extending portions of the hooks are lifted over the necks of the pegs). This helps to ensure that the seating portion 70 does not scrape against or otherwise engage with floor portion 50 when being installed. The arrangement between the hooks and the pegs also helps to ensure that the seating portion 70 is precisely aligned relative to the support 12.

[0029] Figures 12, 13 and 14 illustrate the process whereby the seating portion 70 is brought into engagement with the pegs 28c and 28d. Figure 14 shows the rest position of the seating portion once engaged with the pegs. As illustrated in this Figure, the abutment 90 of end plate 84 acts to positively locate the floor portion 50 by preventing significant backwards (in the direction of installation of the floor portion) movement of that floor portion. As shown in Figure 14, movement of the floor portion relative to the support structure 12 is prevented by action between the rear surface of the floor portion and the abutment 90. Similarly, movement of each floor portion in a direction opposite to the installation direction is prevented by the seating portion acting against the front of the floor portion. This is illustrated, for example, with reference to the floor portion 40 acting against the bar 82 of seating portion 70 illustrated in Figure 14. Although not shown in this Figure, a further seating portion having an and plate with abutment similar to end plate 84 will prevent movement of floor portion 40 in the direction of installation (i.e. opposite to movement prevented by seating portion 70).

[0030] The height between successive floor portions in embodiments which have a tiered arrangement define a rake for the support unit. Embodiments of the invention extend to a arrangement which is modular and where support units are provided with three different rakes. It has been found that this provides the best viewing to distance relationship for occupants of the seats.

[0031] A further significant advantage of embodiments of the invention relates to the ability of the parts to be assembled into a secure seating arrangement which does not require fasteners such as bolts and screws; both the floor portions and the seating portions are retained in place by the weight of the seating portions. Therefore, a seating arrangement according to embodiments of the invention can be erected quickly and dismantled quickly when compared to seating arrangements relying on fastenings to anchor the parts to one another.

[0032] Embodiments of the invention relate to a kit of parts which comprise floor portions and seating portions which are configured to fit to one another and operate with one another in the manner described above. Such a kit of parts may comprise pre-fabricated floor portions and pre-fabricated seating portions. Alternatively, the kit of parts may be provided as one or more dismantled parts.

Claims

1. A kit of parts for constructing a seating arrangement comprising a seating portion, a floor portion and a support structure for supporting both the seating portion and the floor portion when the kit of parts is assembled, wherein the seating portion, floor portion and support structure are adapted so that the floor portion is anchored to the support structure by the seating portion.

2. The kit of parts according to claim 1 wherein the floor portion and the support structure are adapted so that the floor portion slides relative to the support structure and the seating portion is adapted to anchor the floor portion relative to the support structure when the seating portion and the floor portion are installed.

3. The kit of parts according to claim 1 or claim 2 wherein the support structure comprises a lip configured to engage with the floor portion to thereby anchor the floor portion when the floor portion is installed.

4. The kit of parts according to any preceding claim wherein the seating portion comprises an abutment which engages with the floor portion when the floor portion and the seating portion are installed to prevent sliding motion of the floor portion relative to the support structure.

5. The kit of parts according to claim 4 wherein the floor portion comprises a complimentary structure which engages with the abutment to prevent the sliding motion of the floor portion relative to the support structure.

6. The kit of parts according to any preceding claim comprising a plurality of seating portions and floor portions, wherein the support structure is arranged

to support the plurality of seating and floor portions in a tiered arrangement.

7. The kit of parts according to claim 6 wherein the support structure is modular comprising two or more units, each unit supporting seating portions arranged at different rakes.

8. A method of assembling a seating arrangement, the seating arrangement comprising a seating portion, a floor portion and a support structure for supporting both the seating portion and the floor portion when the seating arrangement is assembled, wherein the method comprises anchoring the floor portion to the support structure with the seating portion.

9. The method according to claim 8 further comprising sliding the floor portion relative to the support structure during installation of the floor portion and wherein anchoring the floor portion comprises inhibiting the sliding of the floor portion relative to the support structure.

10. The method according to claim 8 or claim 9 wherein the support structure comprises a lip and wherein the method further comprises anchoring the floor portion by positioning the floor portion so that the lip prevents movement of the floor portion is an least one direction.

11. The method according to any of claims 8 to 10 further comprising causing the floor portion to engage with the support structure by sliding the floor portion relative to the support structure during assembly.

12. The method according to any of claims 8 t0 11 wherein the seating portion comprises an abutment, the method further comprising engaging the abutment with the floor portion when the floor portion and the seating portion are installed to prevent sliding motion of the floor portion relative to the support structure.

13. The method according to claim 12 comprising engaging a complimentary structure of the floor portion with the abutment to prevent the sliding motion of the floor portion relative to the support structure.

14. The method according to any of claims 8 to 13 wherein the seating arrangement further comprises a plurality of seating portions and floor portions, the method further comprising arranging the support structure, the plurality of seating and the floor portions in a tiered arrangement.

15. The method according to claim 14 wherein the support structure is modular comprising two or more units, each unit supporting seating portions arranged at different rakes.

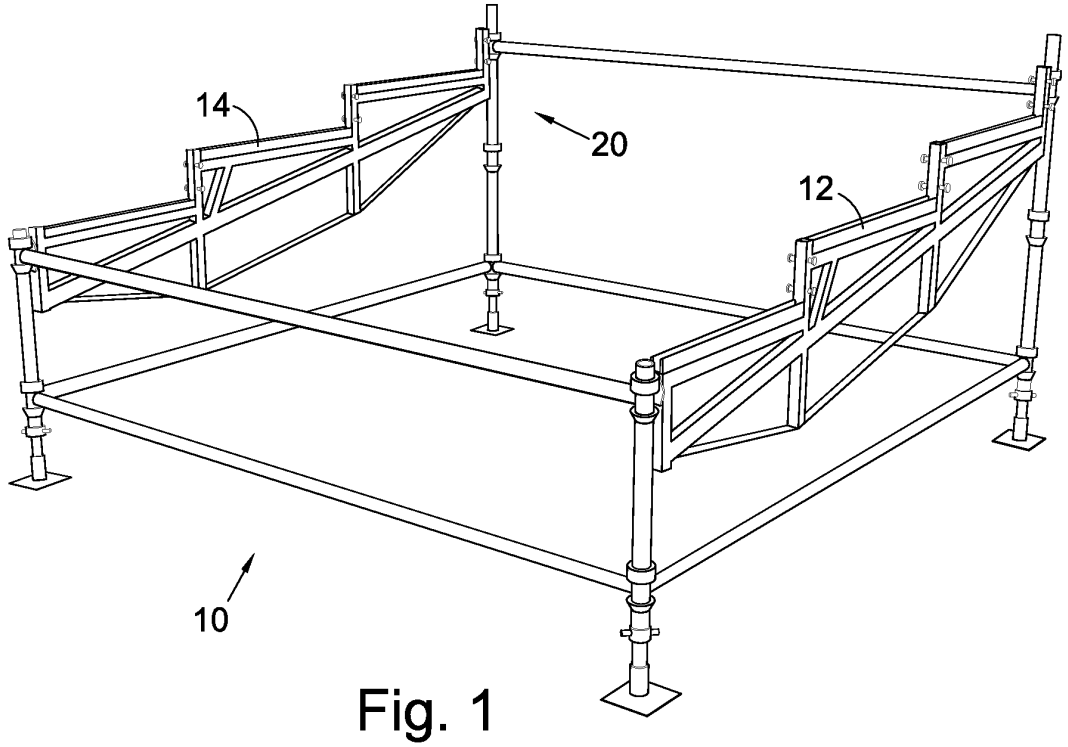

Fig. 1

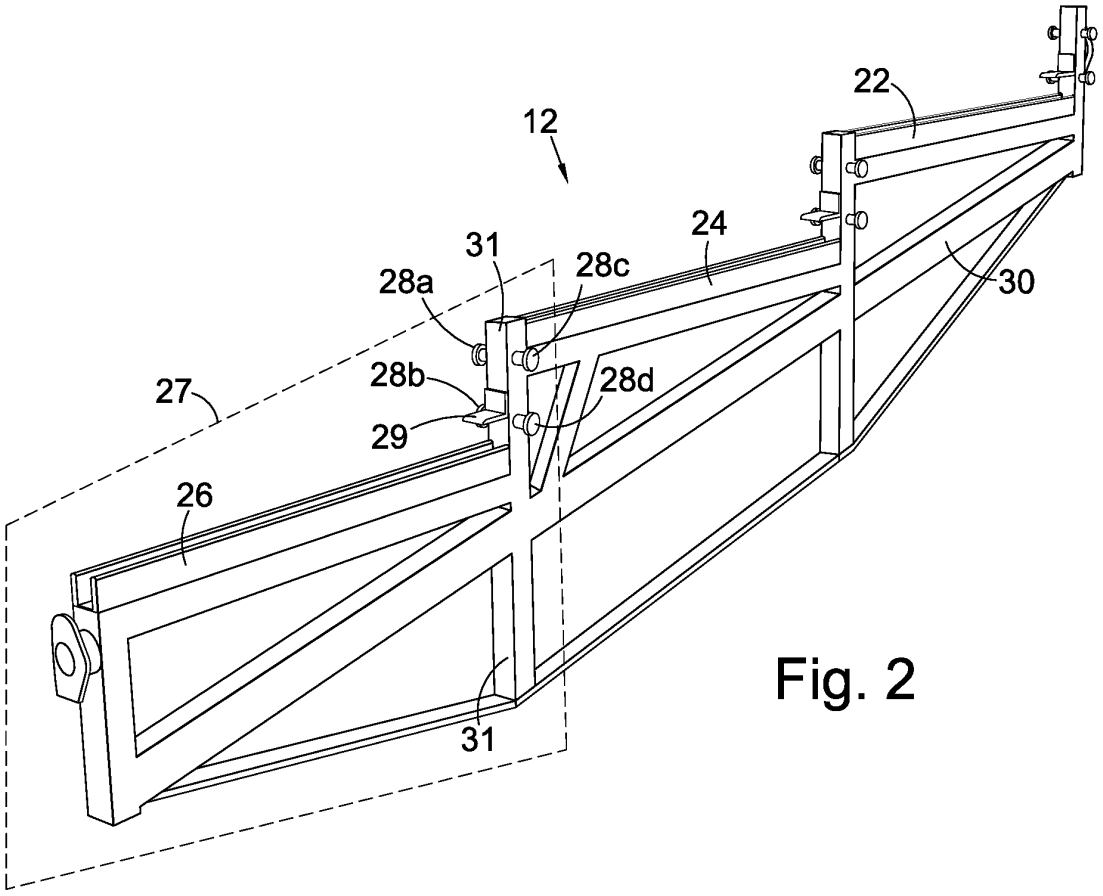

Fig. 2

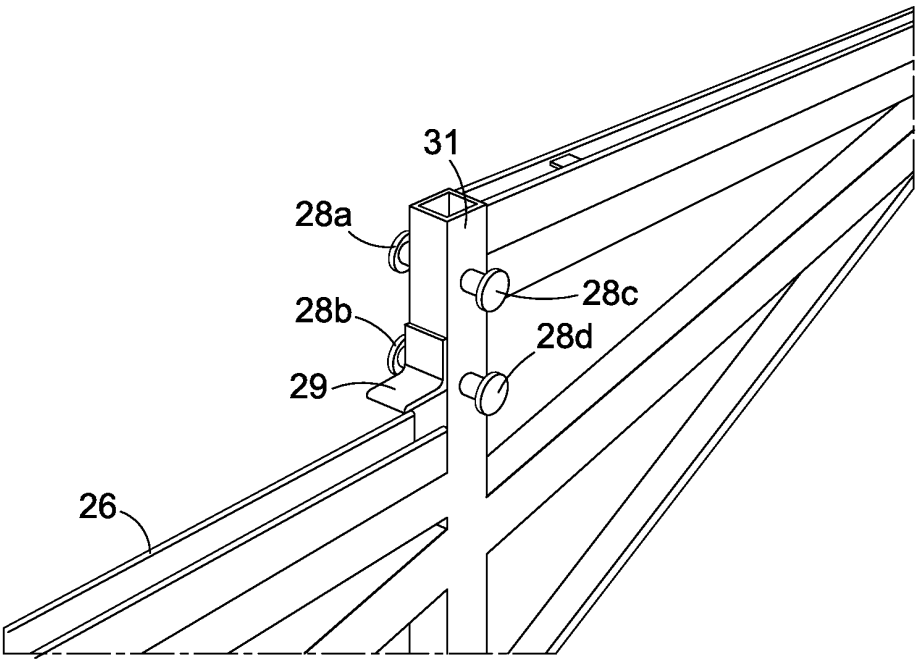

Fig. 3

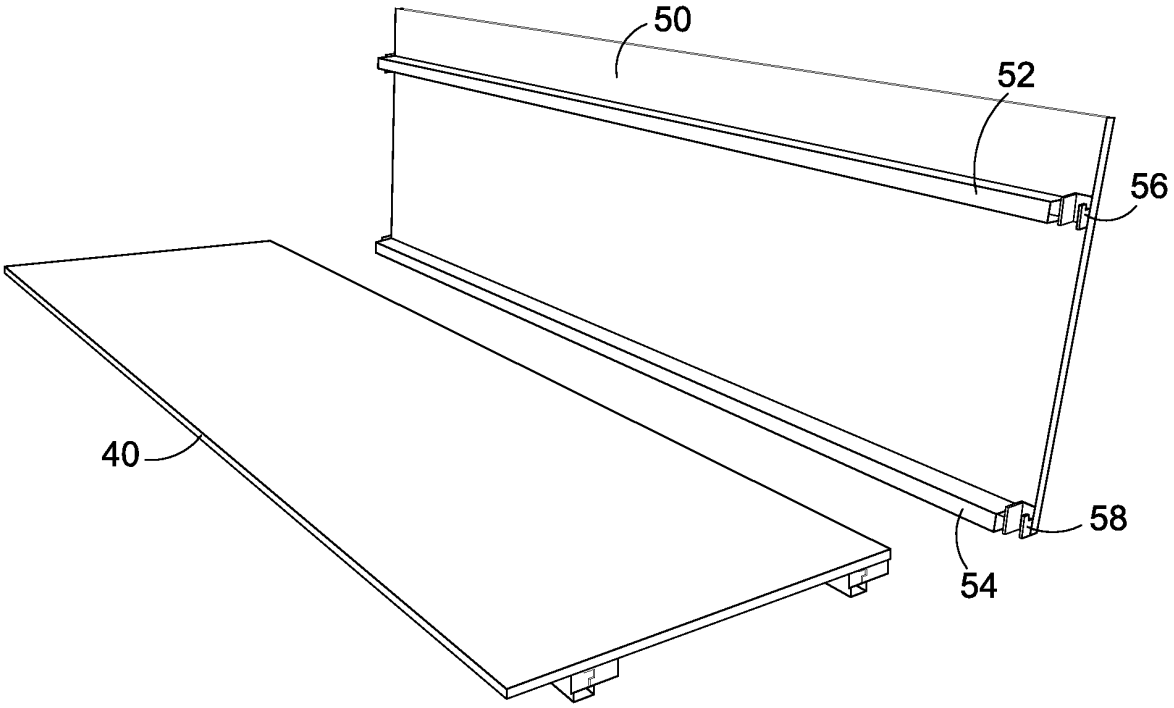

Fig. 4

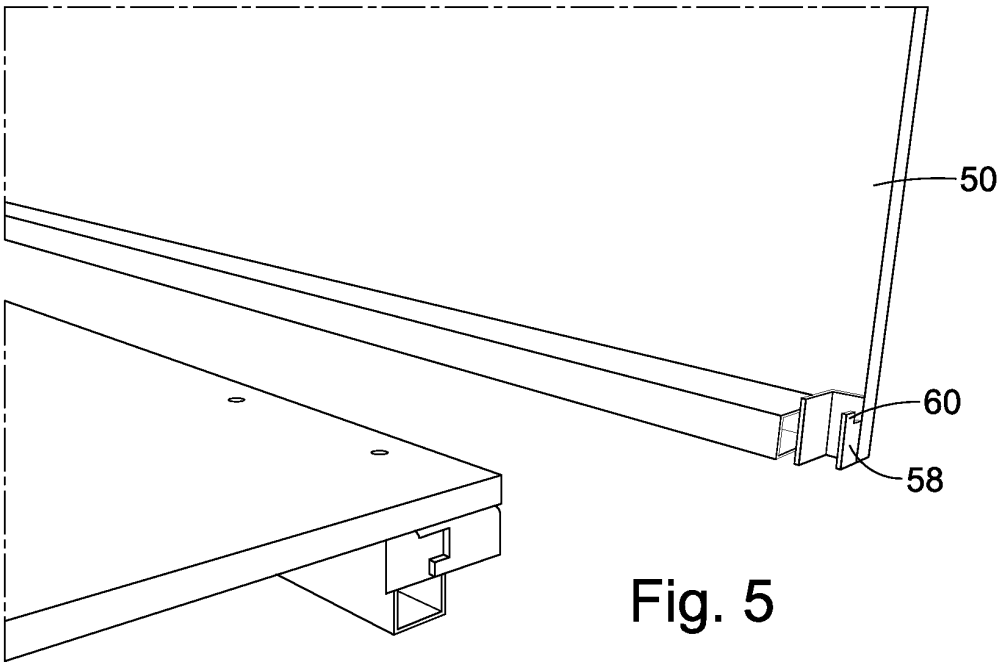

Fig. 5

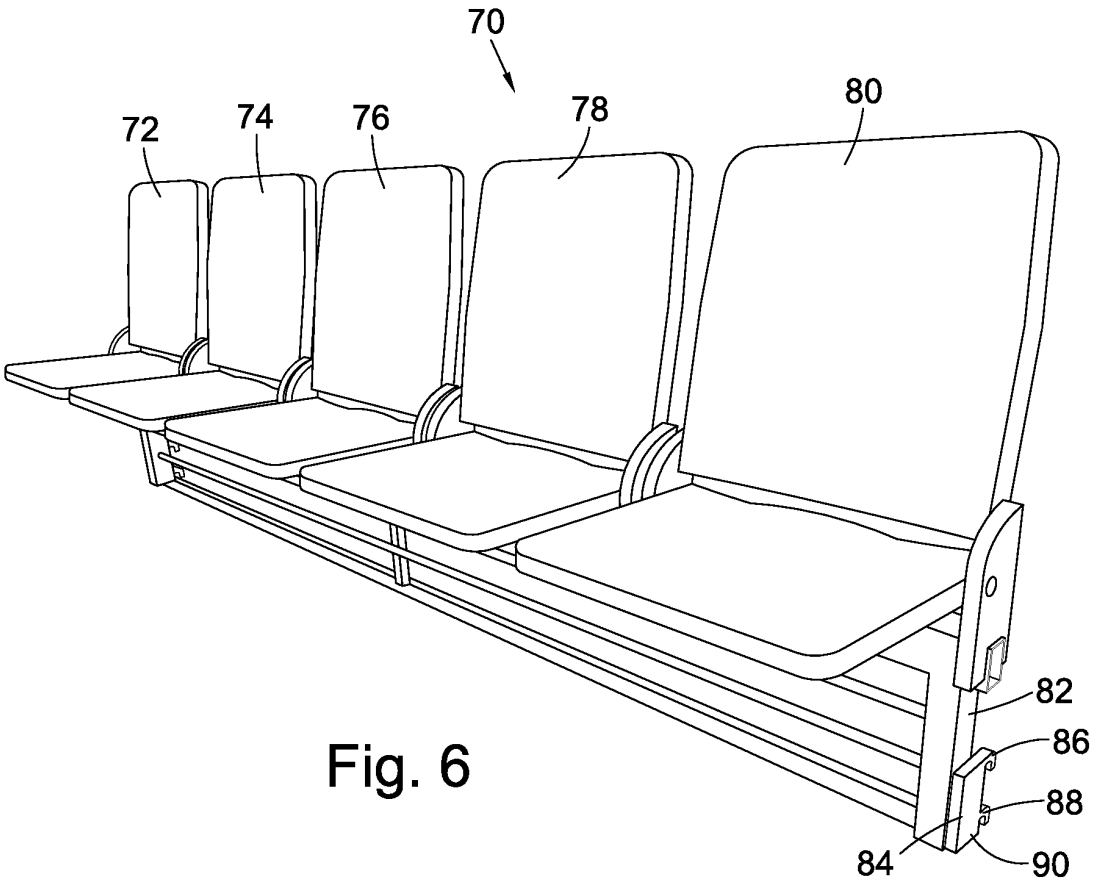

Fig. 6

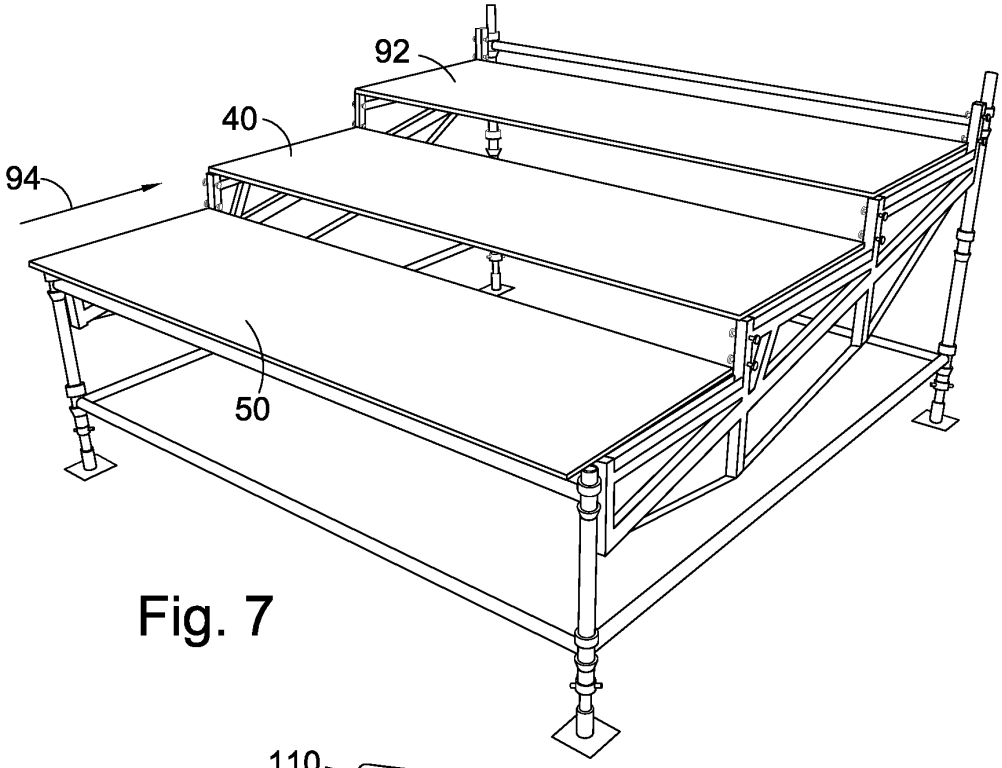

Fig. 7

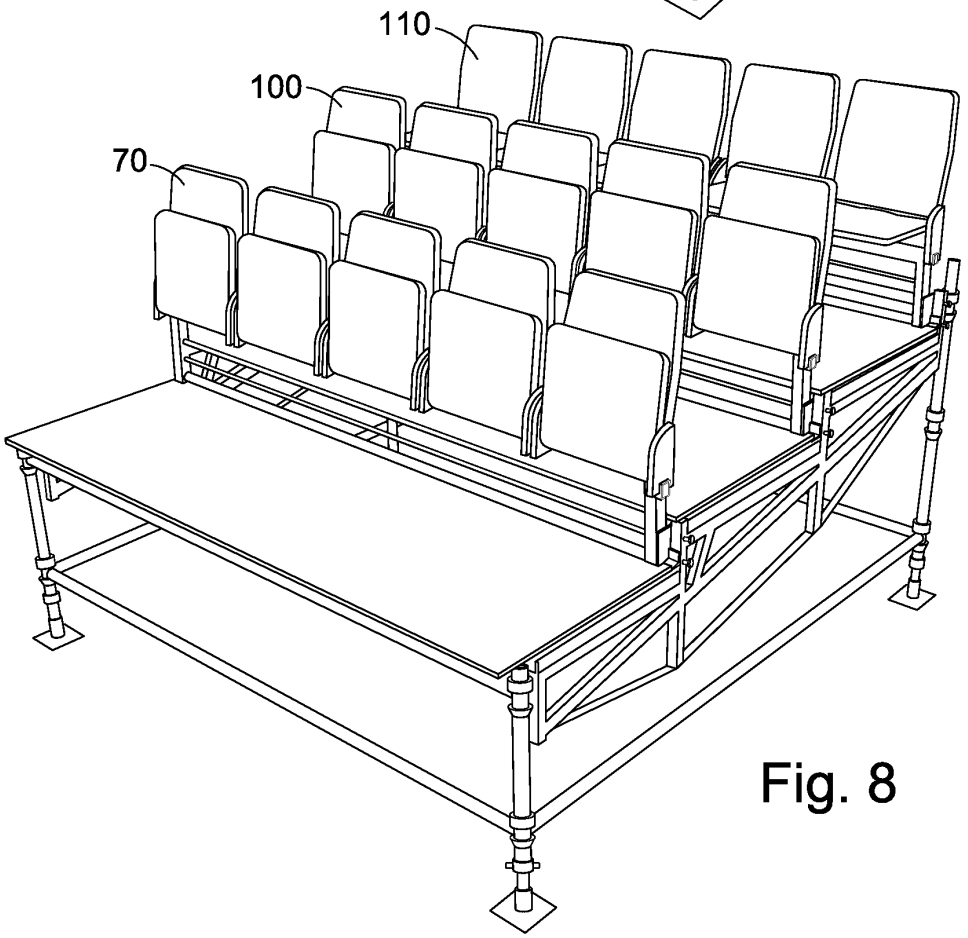

Fig. 8

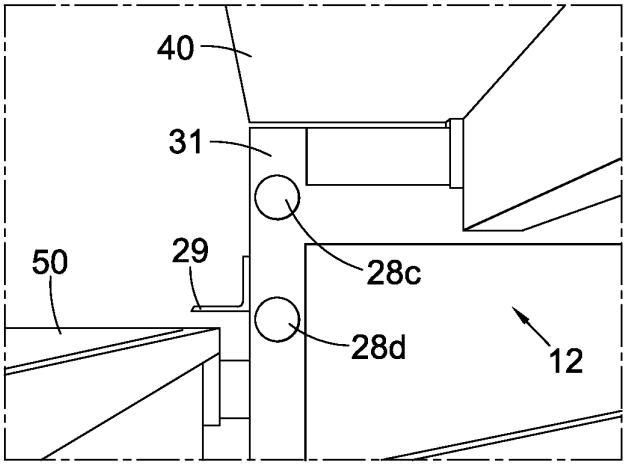

Fig. 9

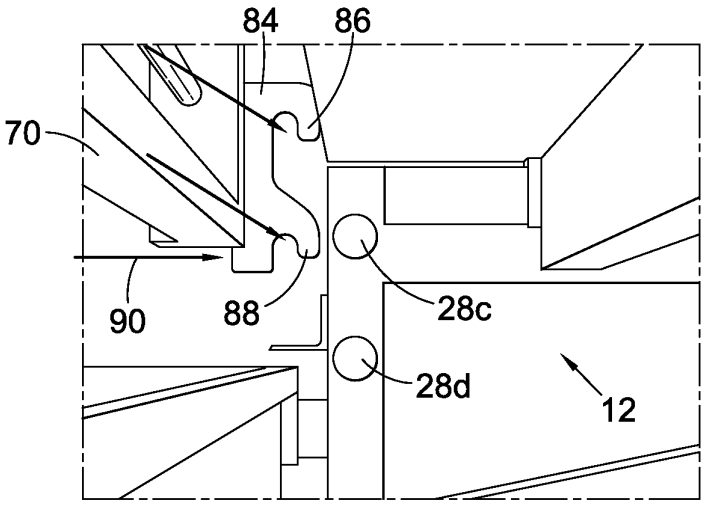

Fig. 10

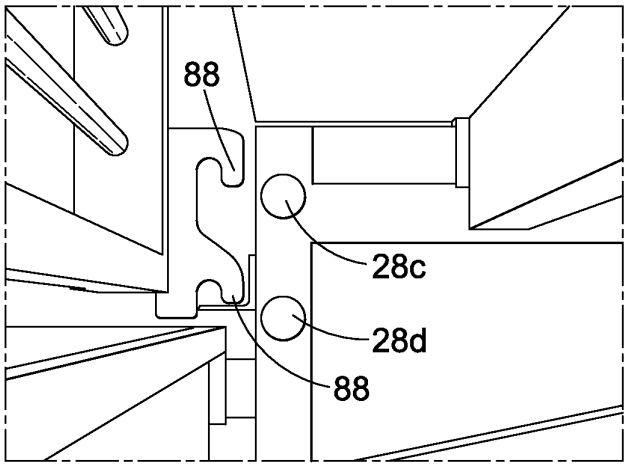

Fig. 11

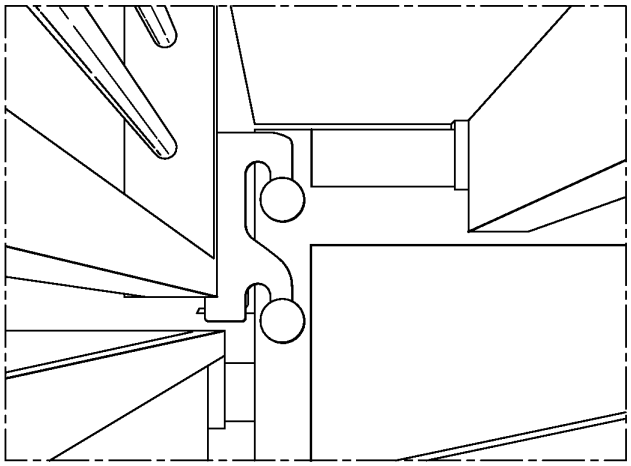

Fig. 12

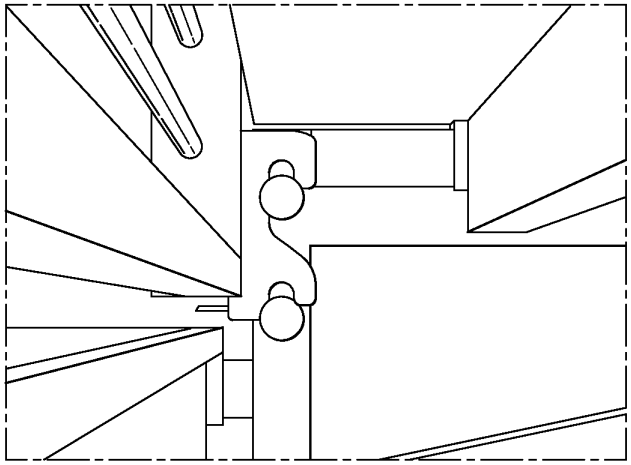

Fig. 13

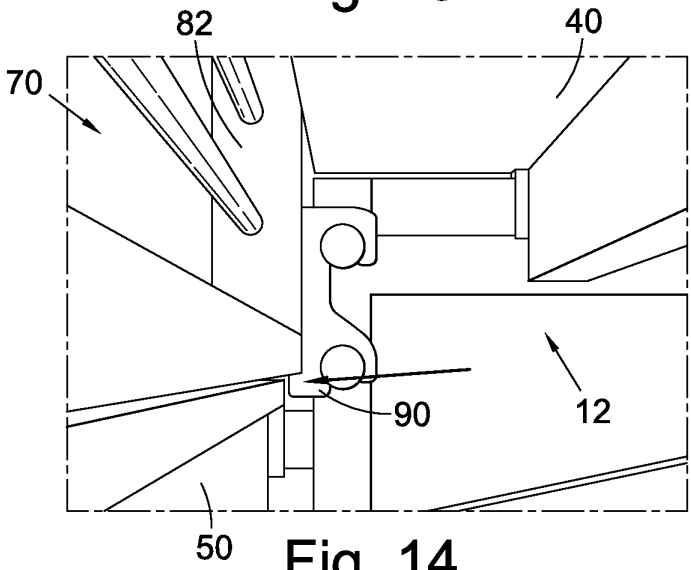

Fig. 14

REFERENCES CITED IN THE DESCRIPTION

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Non-patent literature cited in the description

- *Work at Height Regulations,* 2007 **[0004]**