

(19)



(11)

EP 1 985 203 B1

(12)

EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention
of the grant of the patent:
13.03.2013 Bulletin 2013/11

(51) Int Cl.:
A47B 53/02 (2006.01)

(21) Application number: **08251542.0**

(22) Date of filing: **28.04.2008**

(54) **Furniture system**

Möbelsystem

Système de meubles

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT
RO SE SI SK TR**

(30) Priority: **27.04.2007 GB 0708229**

(43) Date of publication of application:
29.10.2008 Bulletin 2008/44

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Description

Field of the Invention

[0001] The present invention relates to a mobile furniture system for use with a raised access floor, to raised access flooring systems and to components for such systems.

Background

[0002] Mobile storage systems are known to provide increased storage capacity for a given floor area. This can be particularly advantageous in front office applications where space often comes at a premium. One such storage system is shown in US-A-3828680. Another is shown in GB-A-2194781.

[0003] The mobile storage system disclosed in US-A-3828680 either runs on rails or requires grooves to be formed into a permanent floor. In the former case the rails may present a significant trip hazard.

[0004] The mobile storage system of GB-A-2194781 is for office environments and comprises storage units that run along a rail at one end. The storage units have wheels at the end opposite the rail in which the wheels run over a floor or, as is more common in practice, a floor covering such as a carpet. The rail of this system may, however, still present a trip hazard at one end. To minimise the trip hazard requires the construction of an additional false floor and ramp arrangement with an upper surface above that of the rail. This adds additional cost to installation of the mobile storage system. Furthermore, anti-tipping features which are designed to retain the engagement of the storage units with the rail and thus prevent tipping can only be implemented at the rail end of the storage units. This may be disadvantageous in that the length by which the storage units extend from the rail is necessarily limited to prevent tipping. Wear strips, which are often laid on the floor covering to prevent wear of the floor covering by the wheels of the storage units, also tend to buckle under load. Because the mobile storage units are only guided along a rail at one end they also have a natural tendency to skew when moving and this requires that such storage units generally have heavy-duty welded bases for added rigidity. However, such bases contribute to the weight and complexity of the mobile storage units.

[0005] Another mobile storage system is disclosed in British patent application GB 2280408-A. This document relates to the adjustable track assemblies which are directed at levelling pairs of solid rails for wheeled storage units in a freestanding system. European patent application EP0353019-A relates to an adjustable carrier rail system for mobile shelving systems or other storage systems. A carrier plate engages floor surface panels and is suspended between two jack barrels. The carrier plate carries a solid carrier rail having a generally square cross-section which in turn supports a guide rail along which

the mobile storage system runs. It is clear that the carrier plate must be present in order to support the flooring panels indicating that the floor surface panels are associated with a false floor constructed only in the vicinity of the rails, rather than a raised access flooring system. US 3923354-A, Japanese patent publication JP 2007007197-A also relates to a system working on a false floor surface constructed only in the vicinity of the storage system rather than a raised access floor system. US6,840,022 relates to a system for mounting a rail on a support surface. It does not disclose using the system with a raised access flooring system.

[0006] It is an object of the invention to provide an improved mobile furniture system for raised access flooring which overcomes the disadvantages of the prior art systems and, in particular, the need for an additional false floor and ramp arrangement.

Summary of the Invention

[0007] According to a first aspect of the invention there is provided a mobile furniture system, in combination with raised access flooring according to claim 1.

[0008] The raised access flooring may, for example, comprise at least one floor panel.

[0009] Preferably an upper surface of the rail is substantially level with or below the level of an upper surface of the raised access flooring.

[0010] Alternatively, the raised access flooring has a covering such as a carpet or carpet tiles and an upper surface of the rail is substantially level with or below the level of an upper surface of the covering.

[0011] Thus, the requirement to construct a false floor on top of the raised access flooring with an upper surface above that of a rail for the elimination of the trip hazard associated with the rail may be avoided. This is particularly desirable because, not only is the mobile furniture system of the invention simpler and more easily installed, but access to the space beneath the mobile furniture system is also then possible. Raised access flooring is installed in a high-proportion of modern front offices. Thus it is preferable that a mobile furniture system should also be compatible with existing raised access flooring systems. Accordingly, the rails of the mobile furniture system are arranged so that they engage the floor support pedestals and the rails do not protrude above the upper floor surface.

[0012] Preferably, the mobile furniture has a wheel which rolls along the rail during movement of the mobile furniture.

[0013] Preferably, the mobile furniture has an anti-tipping means which engages the rail and acts so as to prevent tipping of the mobile furniture.

[0014] Preferably the mobile furniture system comprises a further rail and the mobile furniture engages and is movable along both the rail and the further rail. The further rail may be tubular and have a slot formed in an upper surface and the mobile furniture engages the upper

surface of the further rail and is movable along the further rail.

[0015] More preferably, the rail engages the mobile furniture in the vicinity of a first end of the mobile furniture and the further rail engages the mobile furniture in the vicinity of a second end of the mobile furniture.

[0016] Most preferably the mobile furniture further comprises a further wheel which rolls along the further rail and/or a further anti-tipping means which engages the further rail and acts so as to prevent tipping of the mobile furniture.

[0017] Having rails at either end of the mobile furniture with which the mobile furniture engages is particularly advantageous for several reasons. First, it may lead to a reduction in the degree of flexing of the mobile furniture compared to a system in which the mobile furniture only engages a single rail at one end. This is beneficial because the mobile furniture can then be of a lighter simpler construction thus reducing the cost to manufacture the mobile furniture. Second, when the mobile furniture has anti-tipping means at either end and each anti-tipping means engages a corresponding rail, the mobile furniture may withstand a greater tipping force when compared to an identical item of mobile furniture having a single anti-tipping means located at one end engaging a single rail. In practice this means that, to withstand a given tipping force, the length of an item of mobile furniture having anti-tipping means at either end can be greater than the length of an item of mobile furniture having an anti-tipping means at just one end.

[0018] Preferably the mobile furniture comprises at least one of a storage unit, a work surface, a screen, a partition, a table or a chair. Most preferably, the mobile furniture unit comprises at least one storage unit to provide a storage system.

[0019] Combining different mobile furniture elements in this way allows for different user needs to be addressed by the same mobile furniture system. In particular, the current trend towards the flexible use of office space can be readily addressed by such a mobile furniture system.

[0020] The floor support pedestal may comprise a pedestal head and a pedestal cap, in which the pedestal cap has a first surface which is arranged to engage the pedestal head and a second surface which is arranged to engage the rail, supporting the flooring and the rail. Thus, the pedestal cap may act as an adaptor between a pedestal head having a standard or existing design and a rail.

[0021] The mobile furniture system may comprise at least one floor support pedestal and the at least one floor support pedestal may be positioned on a regular grid, for example a 600 mm by 600 mm grid. This floor support pedestal grid size is the most common grid size for conventional raised access flooring systems. Correspondingly, for compatibility with such standard raised access flooring systems, the rails should be installed on a pitch which is a multiple of 600 mm. The mobile furniture itself should also be designed to engage rails on a pitch which is a multiple of 600 mm.

[0022] The mobile furniture may be powered. For example, the movement of the mobile furniture may be powered using a motor. In one embodiment of a powered mobile furniture system the rail comprises an electrode for the transmission of electrical power and a slot formed in an upper surface of the rail. Preferably the mobile furniture system further comprises a first electrical pick-up assembly having an electrical terminal in which electrical power is automatically supplied to the electrode via the electrical terminal on insertion of the first electrical pick-up assembly through the slot. Preferably the mobile furniture system further comprises a second electrical pick-up assembly having an electrical terminal in which electrical power is automatically supplied from the electrode to the mobile furniture via the electrical terminal on insertion of the second electrical pick-up assembly through the slot.

[0023] The electrical pick-up assemblies may therefore act as "pick-ups" for the transmission of power to the electrode and from the electrode to the mobile furniture. Power may be automatically supplied to the mobile furniture once the electrical pick-up assemblies are inserted from above into the upward-facing slot in the rail. This is because an electrical pick-up assembly automatically provides an electrically-conductive path between the electrical terminal and the electrode when the electrical pick-up assembly is inserted through the slot in the rail.

[0024] Preferably an electrical pick-up assembly of the mobile furniture system is rotatable, is insertable into the slot when rotated into a first state of rotation, and automatically returns towards a second state of rotation when inserted through the slot so as to provide the electrically-conductive path between the electrical terminal and the electrode.

[0025] Preferably the electrical pick-up assembly comprises an electrically-conductive roller which is electrically connected to the electrical terminal and which makes electrical contact with the electrode when the electrical pick-up assembly automatically returns towards the second state of rotation after being inserted through the slot and in which the roller rolls along and maintains contact with the electrode during movement of the mobile furniture.

[0026] Preferably the rail of the mobile furniture system comprises a further electrode, the electrical pick-up assembly comprises a further electrically-conductive roller which is electrically connected to a further electrical terminal and which makes electrical contact with the further electrode when the electrical pick-up assembly automatically returns towards the second state of rotation after being inserted through the slot and in which the further roller rolls along and maintains contact with the further electrode during movement of the mobile furniture.

[0027] According to a second aspect of the invention there is provided a raised access flooring system comprising raised access flooring, a tubular rail and a floor support pedestal in which the floor support pedestal engages the raised access flooring and the rail, supporting

the flooring and the rail, and mobile furniture is movable along the rail.

[0028] According to a third aspect of the invention there is provided mobile furniture for a mobile furniture system for raised access flooring, the mobile furniture system comprising a tubular rail, a floor support pedestal and the mobile furniture, in which the floor support pedestal engages the raised access flooring and the rail, supporting the flooring and the rail, and the mobile furniture is movable along the rail.

[0029] According to a fourth aspect of the invention there is provided a floor support pedestal for a mobile furniture system for raised access flooring, the mobile furniture system comprising a tubular rail, the floor support pedestal and mobile furniture, in which the floor support pedestal engages the raised access flooring and the rail, supporting the flooring and the rail, and the mobile furniture is movable along the rail.

[0030] According to a fifth aspect of the invention there is provided a pedestal cap of a floor support pedestal for a mobile furniture system for raised access flooring in which the floor support pedestal comprises a pedestal head and the pedestal cap and in which the pedestal cap has a first surface which is arranged to engage the pedestal head and a second surface which is arranged to engage a rail along which mobile furniture is movable.

[0031] According to a sixth aspect of the invention there is provided a rail for a mobile furniture system for raised access flooring, the mobile furniture system comprising the rail, a floor support pedestal and mobile furniture, in which the floor support pedestal engages the raised access flooring and the rail, supporting the flooring and the rail, and the mobile furniture is movable along the rail.

[0032] According to a seventh aspect of the invention there is provided an electrical pick-up assembly for a mobile furniture system in which the electrical pick-up assembly comprises an electrical terminal and the electrical pick-up assembly automatically provides an electrically-conductive path between the electrical terminal and an electrode contained within a rail when the electrical pick-up assembly is inserted through a slot formed in an upper surface of the rail.

Brief Description of the Drawings

[0033] A mobile furniture system in accordance with the invention will be described further, by way of example only, with reference to the accompanying Figures 1 to 22, in which:

Figure 1 is a side elevation of a first embodiment of a mobile furniture system;

Figure 2 is an end elevation of a first embodiment of a mobile furniture system;

Figure 3 is a plan view of a first embodiment of a

mobile furniture system;

Figure 4 is a perspective view of a floor support pedestal of a first embodiment of a mobile furniture system;

Figure 5 is a detailed view of the side elevation of Figure 1 in the vicinity of a wheel of the mobile furniture system;

Figure 6 is a plan view of a rail and pedestal assembly;

Figure 7 is a detailed end view of the rail and pedestal assembly of Figure 6 in the vicinity of the rail;

Figure 8 is a perspective view showing the upper surface of a rail stop;

Figure 9 is a perspective view showing the lower surface of a rail stop;

Figure 10 is a perspective view of a powered mobile furniture system in the vicinity of a powered rail, a powered wheel assembly and a fixed power supply assembly;

Figure 11 is a side view of the powered mobile furniture system of Figure 10;

Figure 12 is a front end view of the powered mobile furniture system of Figure 10;

Figure 13 is a rear end view of the powered mobile furniture system of Figure 10;

Figure 14 is a perspective view from a first angle of the powered mobile furniture system of Figure 10 having cut-away sections at either end of the rail;

Figure 15 is a perspective view from a second angle of the powered mobile furniture system Figure 10 having cut-away sections at either end of the rail;

Figure 16 is a perspective view of a powered rail;

Figure 17 is a perspective view of an inner rail assembly;

Figure 18 is a perspective view of an inner rail;

Figure 19 is a perspective view from a first angle of a mobile power assembly;

Figure 20 is a perspective view from a second angle of a mobile power assembly;

Figure 21 is a perspective view from a first angle of

a fixed power assembly; and

Figure 22 is a perspective view from a second angle of a fixed power assembly.

Description of Preferred Embodiments of the Present Invention

[0034] Figure 1 shows a mobile furniture system constituting an embodiment of the invention in side elevation. This mobile furniture system is designed to be compatible with raised access flooring. Corresponding end elevation and plan views of the mobile furniture system are also shown in Figures 2 and 3 respectively. The mobile furniture system is generally designated 2 and comprises a piece of mobile furniture 4, raised access flooring 6, a plurality of floor support pedestals e.g. 7 and 8 and a plurality of rails e.g. 9 and 10. The raised access flooring 6 is supported by the pedestals 8 above an original floor surface 11. In Figure 1, the piece of mobile furniture 4 is a mobile storage unit. The mobile storage unit 4 has wheel assemblies e.g. 12 and 13 attached to its underside. The wheel assembly 13 comprises a wheel 14 and an axle 16 about which the wheel 14 rotates. The raised access flooring 6 comprises a plurality of floor panels 18. Each floor panel 18 typically measures 600 mm by 600 mm and is supported at each corner by a floor support pedestal e.g. 7 or 8. Correspondingly the floor support pedestals e.g. 7 and 8 are also typically located on a 600 mm by 600 mm uniform grid. It should be noted however, that the floor panel dimensions and the corresponding grid size for the floor support pedestals are not limited in size to 600 mm by 600 mm but may be of a size greater or less than this.

[0035] As shown in Figure 4, the floor support pedestal 8 comprises a pedestal base 20, a pedestal head 22 and a pedestal cap 23. The pedestal cap 23 is secured to the pedestal head 22. In use, the pedestal base 20 rests upon the original floor surface 11 and the upper surface of the pedestal cap 23 supports the raised access flooring 6. In use, the pedestal 8 provides for the adjustment of the height of the raised access flooring 6 (not shown) above the original floor level 11 (not shown) and the floor support pedestal 8 generally incorporates a mechanism for the adjustment of the separation of the pedestal head 22 from the pedestal base 20 for this purpose. For example, the pedestal head 22 may engage the pedestal base 20 via a screw thread coupling. As shown in Figure 4, pedestal cap 23 comprises a pair of lugs 24 which extend upwards from the upper surface of the pedestal cap 23 and are adapted to engage one of the rails 10. It should be noted that in the embodiment of the pedestal shown in Figure 4, the pedestal head 22 and the pedestal cap 23 are shown as separate parts. This may be advantageous because the pedestal cap 23 may then act as an adaptor between the rail 10 and a pedestal head 22 having a standard or existing design. Alternatively, the pedestal head 22 may be adapted to directly engage one

of the rails 10 thus removing the need for an intermediate pedestal cap to act as an adaptor. In these circumstances, pedestal head 22 would be adapted to comprise lugs extending upwards from its upper surface similar to the lugs 24 of the pedestal cap 23 shown in Figure 4.

[0036] Figure 5 shows a detailed view of the side elevation of Figure 1 in the vicinity of the pedestal 8 and the wheel 14 of the mobile storage unit 4. Figures 6 and 7 also show a plan view and an end view respectively of the pedestal 8 supporting the rail 10 without the storage unit 4. The interaction between the wheel 14, the rail 10, the floor panels 18 and the floor support pedestal 8 may be explained with reference to this figure. The tubular rail comprises an open tube having a substantially square cross-section and a slot 26 centrally located on one face. However, it should be appreciated that the cross-section of the rail 10 could alternatively be rectangular or any other suitable shape. Regardless of the rail cross-section, the maximum dimension of the rail cross-section in a direction parallel to the thickness of the floor panels 18 is designed so that the rail does not present a trip hazard to a person moving over the raised access flooring 6. If there is no floor covering, this requires that the uppermost point on the upper face of the rail should be substantially level with or below the upper surface of the floor panels 18. If there is a floor covering, this requires that the uppermost point on the upper face of the rail should be substantially level with or below the upper surface of the floor covering. Note that in Figure 5, the rail cross-section is designed such that the upper face of the rail protrudes above the upper surface of the floor panels 18 by a distance substantially equal to a thickness of a floor covering which is not shown in the figure. For example, for floor panels having a standard thickness of 32 mm, and carpet tiles having a standard thickness of 6 to 8 mm, the rail may have a substantially square cross-section of a dimension of 38 to 40 mm. The rail 10 is sufficiently rigid to support the weight of the mobile storage unit 4. The rail 10 may, for example, be formed from a sheet of metal having a sufficient gauge or thickness to support the weight of the mobile storage unit 4. The rail may comprise a rolled tube formed from a sheet of mild steel having a gauge in the range of 2.5 mm to 3.2 mm in which the tube has a square cross-section of a dimension of 38 to 40 mm and a slot of width 9 to 10 mm running along one face. Such steel rails may also have a hot-dip galvanised surface finish. Alternatively, rail 10 may be formed from a sheet of non-metallic material having a gauge or wall thickness which is sufficient to support the weight of the mobile storage unit 4.

[0037] In Figure 5, the lugs 24 located on the upper surface of the pedestal cap 23 are separated by a distance which is substantially equal to the width of the cross section of the rail 10. In use, the rail 10 is inserted between the lugs 24 of the pedestal cap 23 and directly engages the upper surface of the pedestal cap 23. As best shown in Figure 6, the rail 10 is fixed to the pedestal cap 23 using fasteners such as screws 25. The corners of the

raised access floor panels 18 directly engage the regions of the upper surface of the pedestal cap 23 which lie either side of the rail 10. The wheel 14 rests upon and rolls along the upper surface of the rail 10. The wheel 14 comprises a flange 28, a first wheel portion 30 and a second wheel portion 32. The flange 28, the first wheel portion 30 and the second wheel portion 32 are all co-axial. The flange 28 is located at an axial position between the first wheel portion 30 and the second wheel portion 32. The first wheel portion 30 and the second wheel portion 32 engage and rest upon the upper surface of the rail 10. Accordingly, the flange 28 extends through the slot 26 in the rail 10, such that the slot 26 acts to guide the wheel 14 so as to roll along the rail 10. The wheel assembly 13 further comprises a right-angle bracket 34. In the end view of Figure 5, the right-angle bracket 34 has a vertical portion joined at one end to a horizontal portion to form an "L-shaped" cross-section. The vertical portion of the right-angle bracket extends downwards from the wheel assembly 13 through the slot 26 in the rail 10 to join the horizontal portion of the right-angle bracket 34. The horizontal portion of the right-angle bracket 34 extends sideways from the vertical portion sufficiently such that, in the event that the mobile storage unit 4 is subjected to a tipping force, the horizontal portion of the right-angle bracket 34 engages the internal surface of the rail 10 and acts to prevent significant tipping of the mobile storage unit 4. For example, the tipping force may have a component parallel to the rail 10 and be applied at a point on the storage unit 4 substantially towards the top of the storage unit. On initial tipping of the storage unit 4, the right-angle bracket 34 comes into physical contact with the internal surface of the rail and thus acts to prevent significant tipping of the storage unit 4. For ease of fitting, the horizontal portion of the bracket 34 is inserted through the slot 26 in the rail 10 prior to attachment of the vertical portion of the bracket 34 to the wheel assembly 13.

[0038] A rail stop 40 such as that shown in Figures 8 and 9 may also be fitted inside rail 10 via fixing screws 42. The rail stop 40 blocks the path of the bracket 34 of the wheel assembly 13 and the position of the rail stop 40 thus determines a travel end-point of the storage unit 4.

[0039] As shown in Figures 1 to 3, the mobile storage unit 4 is constrained to move in a direction parallel to rails 9 and 10. In Figure 3, for example, the rails 9 and 10 are separated by a distance equal to twice the pitch of the pedestal grid. However, the number of rails and the separation of the rails may be different to those shown in Figure 3. In the embodiment of the mobile furniture system shown in Figures 1 to 3, the mobile storage unit 4 also has four wheels. However, the storage unit may have more or fewer wheels than this. Two of the wheels engage rail 9 and are located substantially at a first end of the storage unit 4, while the other two wheels engage rail 10 and are located substantially at a second end of the storage unit 4. Having wheels at either end of storage

unit 4 helps to maintain the rigidity of storage unit 4. Consequently, the storage unit 4 may have a light, simple and low cost construction. Furthermore, anti-tipping means such as the right-angle bracket 34 may be fitted at the first and second ends of storage unit 4 and engage corresponding rails 9 and 10. This arrangement is advantageous because the storage unit 4 can then withstand larger tipping forces without tipping significantly compared to the case when only one anti-tipping means such as the right-angle bracket 34 engages a single rail such as rail 10.

[0040] To provide the flexibility of purpose that is often required especially in modern front office applications, the mobile furniture system may incorporate at least one mobile storage unit, a mobile work surface, a mobile screen, a mobile partition, a mobile table, a mobile chair, or any combination of these.

[0041] The movement of the mobile furniture system may be powered. For example, the mobile furniture may comprise a motor which drives the mobile furniture along the rail 9 or 10. The mobile furniture may also be powered for purposes other than movement. For example, the mobile furniture may comprise a light. Irrespective of the nature of the requirement, electrical power may be provided via a powered rail. An embodiment of a such a powered mobile furniture system is shown in Figure 10. A single powered wheel assembly is generally designated 50, a powered rail is generally designated 52 and a fixed power supply assembly is generally designated 54. In use, power is supplied to the powered rail 52 via the fixed power supply assembly 54 and power is provided from the powered rail 52 to the mobile furniture via "pick-ups" incorporated into the powered wheel assembly 50. It should be apparent that, in the interests of clarity, floor support pedestals, raised access flooring and those parts of the mobile furniture supported by the powered wheel assembly 50 have all been omitted from Figure 10. In addition, although the right-angle anti-tipping bracket 34 shown in Figure 5 is not compatible with the particular embodiment of the powered mobile furniture system shown in Figure 10, other anti-tipping arrangements may be conceived of which are compatible with the system. Alternatively, an item of powered mobile furniture may engage a powered rail and, in addition, have anti-tipping means that engage other unpowered rails. The powered wheel assembly 50 comprises an enclosure 56, a wheel 58, an axle 60 about which the wheel 58 rotates and a mobile power assembly generally designated 62. Different views of the powered mobile furniture system of Figure 10 are also shown in Figures 11 to 15. In these views, like reference numerals correspond to like features.

[0042] The powered rail 52 is shown in more detail in Figure 16. The powered rail 52 comprises an outer rail 64 having a slot 65, an electrically-insulating inner rail 66 and electrically-conductive electrodes 67. The outer rail 64 is identical to the rails e.g. 9 and 10 appearing in earlier figures and substantially encloses the inner rail 66. The inner rail 66 carries the electrodes 67 and insulates the

electrodes 67 from one another and from the outer rail 64. A more detailed view of the inner rail 66 carrying the electrodes 67 is shown in Figure 17. As shown in Figure 18, the inner rail has an opening 68 along its top side and recesses 69 which are designed to locate the electrodes 67 within the powered rail 52 at fixed positions along the length of the powered rail 52. For example, as shown in Figure 16, the recesses 69 carry the electrodes 67 and locate them at positions either side of the slot 65 at a height substantially half-way up the vertical side-walls of the powered rail 52. In one embodiment the inner rail 66 may be formed from an insulating plastic or rubber material and the electrodes 67 may be formed from copper strips.

[0043] The mobile power assembly 62 is shown in Figures 19 and 20 and comprises an electrical pick-up assembly generally designated 70, an arm 71 and a plate 72 having holes 73. The arm 71 has a first portion 74 and a second portion 75. The first portion 74 of the arm 71 extends from the plate 72 in a horizontal direction perpendicular to the plate 73. The second portion 75 of the arm 71 extends from the first portion 74 in a horizontal direction perpendicular to the first portion 74. The arm 71 connects the electrical pick-up assembly 70 to the plate 72. The electrical pick-up assembly 70 is rotatable about a vertical axis which passes through the second portion 75 of the arm 71. The electrical pick-up assembly 70 comprises an electrically-insulating carrier 76, two electrically-conducting rollers 78, two electrically-conducting bolts 80, two cable terminals 82, two nuts 84, a spring 86 and a split ring 88. The carrier 76 comprises a proximal portion and a shaft 90 which extends vertically upwards from the proximal portion through a hole in the second portion 75 of the arm 71. The split ring 88 retains the shaft 90 in the hole in the second portion 75 of the arm 71 such that the carrier 76 is free to rotate about the vertical axis of the shaft 90. Horizontally oriented recesses 91 are formed half-way down each vertical end of the proximal portion of the carrier 76 so as to form horizontally extending upper and lower lugs 92 and 94 respectively. Vertical co-axial holes are formed in the lugs 92 and 94. A roller 78 having a concentric through-hole is arranged between the lugs 92 and 94 with its axis co-axial with the vertical holes formed in the lugs 92 and 94. Vertically oriented bolts 80 pass through the holes in the lugs 92 and 94 and the rollers 78. Each bolt 80 is secured in place using a nut 84 and carries a cable terminal 82 which is sandwiched between the nut 84 and the carrier 76. A spring 86 is wrapped around the upright shaft of the carrier 76. The spring 86 has a first end which engages the arm 71 and a second end which engages the proximal portion of the carrier 76. The spring 86 urges the electrical pick-up assembly 70 to return to a default orientation. The orientation of the electrical pick-up assembly 70 is defined in plan view as the acute angle between the direction of the second portion 75 of the arm 71 and the direction of a line passing through the axes of the bolts 80. The default orientation of the electrical pick-up as-

sembly 70 is about 20° but it should be apparent that the default orientation of the electrical pick-up assembly 70 may have any value in the range 0 - 90°. A cable tie 98 is used to fix the cables 96 to the first portion 74 of the arm 71.

[0044] The fixed power supply assembly 54 is shown in more detail in Figure 21 and 22 and comprises an electrical pick-up assembly 100, an arm 102, a plate 104 and power supply cables 106. The arm 102 connects the electrical pick-up assembly 100 to the plate 104. The electrical pick-up assembly 100 and the arm 102 are identical to the electrical pick-up assembly 70 and the arm 71 of the mobile power assembly 62 of Figures 19 and 20.

[0045] In use, as shown in Figure 10, the fixed power assembly 54 is attached to the powered rail 52 via fasteners such as screws which pass through holes 108 in the plate 104 and extend into the outer rail 64. The mobile power assembly 62 is attached to the powered wheel assembly 50 via fasteners such as screws which pass through holes 73 in the plate 72 and extend into the enclosure 56.

[0046] The electrical pick-up assemblies 70 and 100 of the mobile power assembly and the fixed power supply assembly respectively are readily fitted through the slot 65 of the powered rail 52 by first rotating them so as to be substantially parallel to the slot 65 (i.e. to have an orientation substantially equal to 0°). The electrical pick-up assemblies 70 and 100 are inserted through the slot 65 from above into the space between the electrodes 67. The electrical pick-up assemblies 70 and 100 are then automatically urged by their respective springs e.g. 86 to return to their default orientations such that the rollers e.g. 78 of the electrical pick-up assemblies 70 and 100 are urged against the electrodes 67. An electrically-conductive path is then formed from the input cables 106 of the fixed power supply assembly 54 to the output cables 96 of the mobile power assembly 62 and electrical power is provided to the mobile furniture via this electrically-conductive path.

Claims

1. A mobile furniture system in combination with raised access flooring, comprising a plurality of floor panels, a floor support pedestal which supports the raised floor panels above an original from surface, a tubular rail having a slot formed in an upper surface. and mobile furniture, wherein the floor support pedestal engages the floor panels and the rail, and the mobile furniture engages the upper surface of the rail and is movable along the rail.
2. A mobile furniture system in combination with raised access flooring as claimed in claim 1 in which an upper surface of the rail is substantially level with or below the level of an upper surface of the raised access flooring.

3. A mobile furniture system in combination with raised access flooring as claimed in claim 1 or 2 where the raised access flooring has a covering and in which an upper surface of the rail is substantially level with or below the level of an upper surface of the covering. 5
4. A mobile furniture system in combination with raised access flooring as claimed in claim 3 in which the covering comprises a carpet or carpet tiles 10
5. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the mobile furniture comprises a wheel which rolls along the rail during movement of the mobile furniture. 15
6. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the mobile furniture comprises an anti-tipping means which engages the rail so as to prevent tipping of the mobile furniture. 20
7. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the mobile furniture system comprises a further tubular rail having a slot formed in an upper surface, and the mobile furniture engages the upper surface of the further rail and is movable along the further rail. 25
8. A mobile furniture system in combination with raised access flooring as claimed in claim 7 in which the mobile furniture engages the rail in the vicinity of a first end of the mobile furniture and the mobile furniture engages the further rail in the vicinity of a second end of the mobile furniture. 30
9. A mobile furniture system in combination with raised access flooring as claimed in claim 7 or 8 in which the mobile furniture further comprises a further wheel which rolls along the further rail. 35
10. A mobile furniture system in combination with raised access flooring as claimed in any of claims 7 to 9 in which the mobile furniture further comprises a further anti-tipping means which acts so as to prevent tipping of the mobile furniture by engaging the further rail. 40
11. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the mobile furniture comprises at least one of a storage unit, a work surface, a screen, a partition, a table or a chair. 45
12. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the floor support pedestal has an upper surface which is arranged to engage the rail. 50
13. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the floor support pedestal comprises a pedestal head and a pedestal cap, and the pedestal cap has a first surface which is arranged to engage the pedestal head and a second surface which is arranged to engage the rail. 55
14. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the mobile furniture system comprises at least one floor support pedestal and the at least one floor support pedestal is positioned on a regular grid.
15. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the mobile furniture, and/or movement of the mobile furniture is powered.
16. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the mobile furniture has a motor.
17. A mobile furniture system in combination with raised access flooring as claimed in any preceding claim in which the rail comprises an electrode for the transmission of electrical power.
18. A mobile furniture system in combination with raised access flooring as claimed in claim 17 further comprising a first electrical pick-up assembly having an electrical terminal in which electrical power is automatically supplied to the electrode via the electrical terminal on insertion of the first electrical pick-up assembly through the slot.
19. A mobile furniture system in combination with raised access flooring as claimed in claim 18 further comprising a second electrical pick-up assembly having an electrical terminal in which electrical power is automatically supplied from the electrode to the mobile furniture via the electrical terminal on insertion of the second electrical pick-up assembly through the slot.
20. A mobile furniture system in combination with raised access flooring as claimed in claim 19 in which an electrical pick-up assembly has an electrical terminal and in which the electrical pick-up assembly is rotatable, is insertable into the slot when rotated into a first state of rotation, and automatically returns towards a second state of rotation when inserted through the slot so as to provide an electrically-conductive path between the electrical terminal and the electrode.
21. A mobile furniture system in combination with raised

access flooring as claimed in claim 20 in which the electrical pick-up assembly comprises an electrically-conductive roller which is electrically connected to the electrical terminal and which makes electrical contact with the electrode when the electrical pick-up assembly automatically returns towards the second state of rotation after being inserted through the slot and in which the roller rolls along and maintains contact with the electrode during movement of the mobile furniture.

22. A mobile furniture system in combination with raised access flooring as claimed in claim 21 in which the rail comprises a further electrode, the electrical pick-up assembly comprises a further electrically-conductive roller which is electrically connected to a further electrical terminal and which makes electrical contact with the further electrode when the electrical pick-up assembly automatically returns towards the second state of rotation after being inserted through the slot and in which the further roller rolls along and maintains contact with the further electrode during movement of the mobile furniture.

Patentansprüche

1. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden, mit mehreren Bodenplatten, einem Bodentragfuß, der die erhöhten Bodenplatten über einer ursprünglichen Bodenfläche trägt, einer Rohrschiene mit einem in einer Oberseite ausgebildeten Schlitz und einem mobilen Möbel, wobei der Bodentragfuß mit den Bodenplatten und der Schiene in Eingriff steht und das mobile Möbel die Oberseite der Schiene greift und entlang der Schiene bewegbar ist.
2. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 1, bei welchem eine Oberseite der Schiene im Wesentlichen auf dem gleichen Niveau oder unter dem Niveau einer Oberseite des Doppelfußbodens liegt.
3. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 1 oder 2, bei welchem der Doppelfußboden einen Belag hat und bei welchem eine Oberseite der Schiene im Wesentlichen auf dem gleichen Niveau oder unter dem Niveau einer Oberseite des Belages liegt.
4. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 3, bei welchem der Belag einen Teppich oder Teppichfliesen aufweist.
5. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem das mobile Möbel ein Rad auf-

weist, welches während einer Bewegung des mobilen Möbels entlang der Schiene rollt.

6. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem das mobile Möbel eine Antikippeinrichtung aufweist, welche mit der Schiene in Eingriff steht, um so ein Kippen des mobilen Möbels zu verhindern.
7. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem das mobile Möbelsystem eine weitere Rohrschiene mit einem in einer Oberseite ausgebildeten Schlitz aufweist und das mobile Möbel die Oberseite der weiteren Schiene greift und entlang der weiteren Schiene bewegbar ist.
8. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 7, bei welchem das mobile Möbel die Schiene in der Nähe eines ersten Endes des mobilen Möbels greift und das mobile Möbel die weitere Schiene in der Nähe eines zweiten Endes des mobilen Möbels greift.
9. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 7 oder 8, bei welchem das mobile Möbel zudem ein weiteres Rad aufweist, welches entlang der weiteren Schiene rollt.
10. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der Ansprüche 7 bis 9, bei welchem das mobile Möbel zudem eine weitere Antikippeinrichtung aufweist, welche wirkt, um durch Eingriff mit der weiteren Schiene ein Kippen des mobilen Möbels zu verhindern.
11. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem das mobile Möbel wenigstens ein Element einer Lagereinheit, einer Arbeitsfläche, eines Bildschirms, einer Trennwand, eines Tisches oder eines Stuhls aufweist.
12. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem der Bodentragfuß eine Oberseite hat, welche angeordnet ist, um mit der Schiene in Eingriff zu stehen.
13. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem der Bodentragfuß einen Fußkopf und eine Fußkappe aufweist und die Fußkappe eine erste Fläche, welche angeordnet ist, um mit dem Fußkopf in Eingriff zu stehen, und eine zweite Fläche, welche angeordnet ist, um mit der Schiene in Eingriff zu stehen, hat.

14. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem das mobile Möbelsystem wenigstens einen Bodentragfuß aufweist und der wenigstens eine Bodentragfuß auf einem gleichmäßigen Gitter positioniert ist. 5
15. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem das mobile Möbel und/oder eine Bewegung des mobilen Möbels motorisch angetrieben ist. 10
16. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem das mobile Möbel einen Motor hat. 15
17. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach einem der vorherigen Ansprüche, bei welchem die Schiene eine Elektrode für die Übertragung elektrischer Energie aufweist. 20
18. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 17, ferner mit einer ersten elektrischen Mitnehmeranordnung mit einem elektrischen Anschluss, wobei der Elektrode beim Einsatz der ersten elektrischen Mitnehmeranordnung durch den Schlitz über den elektrischen Anschluss automatisch elektrische Energie zugeführt wird. 25 30
19. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 18, ferner mit einer zweiten elektrischen Mitnehmeranordnung mit einem elektrischen Anschluss, wobei dem mobilen Möbel beim Einsatz der zweiten elektrischen Mitnehmeranordnung durch den Schlitz über den elektrischen Anschluss automatisch elektrische Energie von der Elektrode zugeführt wird. 35 40
20. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 19, bei welchem eine elektrische Mitnehmeranordnung einen elektrischen Anschluss hat und bei welchem die elektrische Mitnehmeranordnung drehbar ist, in einen ersten Rotationszustand gedreht in den Schlitz einsetzbar ist und durch den Schlitz eingesetzt automatisch zu einem zweiten Rotationszustand zurückkehrt, um so einen elektrisch leitenden Pfad zwischen dem elektrischen Anschluss und der Elektrode vorzusehen. 45 50
21. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 20, bei welchem die elektrische Mitnehmeranordnung eine elektrisch leitfähige Rolle aufweist, welche mit dem elektrischen Anschluss elektrisch verbunden ist und wel-

che mit der elektrischen Elektrode einen elektrischen Kontakt herstellt, wenn die elektrische Mitnehmeranordnung nach ihrem Einsetzen durch den Schlitz automatisch zum zweiten Rotationszustand zurückkehrt, und bei welchem die Rolle während einer Bewegung des mobilen Möbels entlang der Elektrode rollt und mit dieser Kontakt hält.

22. Mobiles Möbelsystem in Kombination mit einem Doppelfußboden nach Anspruch 21, bei welchem die Schiene eine weitere Elektrode aufweist, die elektrische Mitnehmeranordnung eine weitere elektrisch leitfähige Rolle aufweist, welche mit einem weiteren elektrischen Anschluss elektrisch verbunden ist und welche mit der weiteren Elektrode einen elektrischen Kontakt herstellt, wenn die elektrische Mitnehmeranordnung nach ihrem Einsetzen durch den Schlitz automatisch zum zweiten Rotationszustand zurückkehrt, und bei welchem die weitere Rolle während einer Bewegung des mobilen Möbels entlang der weiteren Elektrode rollt und mit dieser Kontakt hält.

Revendications

1. Système de meuble mobile en combinaison avec un plancher surélevé, comprenant une pluralité de panneaux de plancher, un socle de support de plancher qui supporte les panneaux de plancher surélevés au-dessus d'une surface de plancher d'origine, un rail tubulaire comprenant une fente formée dans une surface supérieure et un meuble mobile, dans lequel le socle du support de plancher se met en prise avec les panneaux de plancher et le rail, et le meuble mobile se met en prise avec la surface supérieure du rail et est mobile le long du rail.
2. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 1, dans lequel une surface supérieure du rail est sensiblement de niveau avec une surface supérieure du plancher surélevé ou en dessous du niveau de celle-ci.
3. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 1 ou 2, où le plancher surélevé présente un revêtement et dans lequel une surface supérieure du rail est sensiblement à niveau avec ou en dessous du niveau d'une surface supérieure du revêtement.
4. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 3, dans lequel le revêtement comprend une moquette ou des dalles de moquette.
5. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des re-

vendications précédentes, dans lequel le meuble mobile comprend une roue qui roule le long du rail lors du déplacement du meuble mobile.

6. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications précédentes, dans lequel le meuble mobile comprend des moyens anti-basculement qui se mettent en prise avec le rail afin d'empêcher le basculement du meuble mobile. 5
7. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications précédentes, dans lequel le système de meuble mobile comprend un autre rail tubulaire ayant une fente formée dans une surface supérieure et le meuble mobile se met en prise avec la surface supérieure de l'autre rail et est mobile le long de l'autre rail. 10
8. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 7, dans lequel le meuble mobile se met en prise avec le rail à proximité d'une première extrémité du meuble mobile et le meuble mobile se met en prise avec l'autre rail à proximité d'une seconde extrémité du meuble mobile. 15
9. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 7 ou 8, dans lequel le meuble mobile comprend en outre une autre roue qui roule le long de l'autre rail. 20
10. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications 7 à 9, dans lequel le meuble mobile comprend en outre d'autres moyens anti-basculement qui servent à empêcher le basculement du meuble mobile grâce à la mise en prise avec l'autre rail. 25
11. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications précédentes, dans lequel le meuble mobile comprend au moins l'un parmi une unité de stockage, un plan de travail, un écran, une cloison, une table ou une chaise. 30
12. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications précédentes, dans lequel le socle du support de plancher a une surface supérieure qui est conçue pour se mettre en prise avec le rail. 35
13. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications précédentes, dans lequel le socle du support de plancher comprend une tête de socle et 40

une couronne de socle, et la couronne de socle a une première surface qui est conçue pour se mettre en prise avec la tête de socle et une seconde surface qui est conçue pour se mettre en prise avec le rail.

14. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications précédentes, dans lequel le système de meuble mobile comprend au moins un socle de support de plancher et l'au moins un socle de support de plancher est positionné sur une grille régulière. 45
15. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications précédentes, dans lequel le meuble mobile et/ou le déplacement du meuble mobile est motorisé. 50
16. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications précédentes, dans lequel le meuble mobile a un moteur. 55
17. Système de meuble mobile en combinaison avec un plancher surélevé selon l'une quelconque des revendications précédentes, dans lequel le rail comprend une électrode pour la transmission d'électricité.
18. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 17, comprenant en outre un premier ensemble de détection électrique comprenant une borne électrique dans laquelle de l'énergie électrique est automatiquement fournie à l'électrode par le biais de la borne électrique lors de l'insertion du premier ensemble de détection électrique à travers la fente.
19. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 18, comprenant en outre un second ensemble de détection électrique comprenant une borne électrique dans laquelle de l'énergie électrique est automatiquement fournie de l'électrode au meuble mobile par le biais de la borne électrique lors de l'insertion du second ensemble de détection électrique à travers la fente.
20. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 19, dans lequel un ensemble de détection électrique a une borne électrique et dans lequel l'ensemble de détection électrique est rotatif, est insérable dans la fente lorsqu'il est tourné dans un premier état de rotation et revient automatiquement vers un second état de rotation lorsqu'il est inséré à travers la fente de sorte à générer un trajet électro-conducteur entre la borne électrique et l'électrode.

21. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 20, dans lequel l'ensemble de détection électrique comprend un rouleau électro-conducteur qui est connecté électriquement à la borne électrique et qui établit un contact électrique avec l'électrode lorsque l'ensemble de détection électrique revient automatiquement vers le second état de rotation après avoir été inséré à travers la fente et le long duquel le rouleau roule et maintient le contact avec l'électrode lors du déplacement du meuble mobile.
22. Système de meuble mobile en combinaison avec un plancher surélevé selon la revendication 21, dans lequel le rail comprend une autre électrode, l'ensemble de détection électrique comprend un autre rouleau électro-conducteur qui est connecté électriquement à une autre borne électrique et qui établit un contact électrique avec l'autre électrode lorsque l'ensemble de détection électrique revient automatiquement vers le second état de rotation après avoir été inséré à travers la fente et le long duquel l'autre rouleau roule et maintient le contact avec l'autre électrode lors du déplacement du meuble mobile.

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Fig. 1

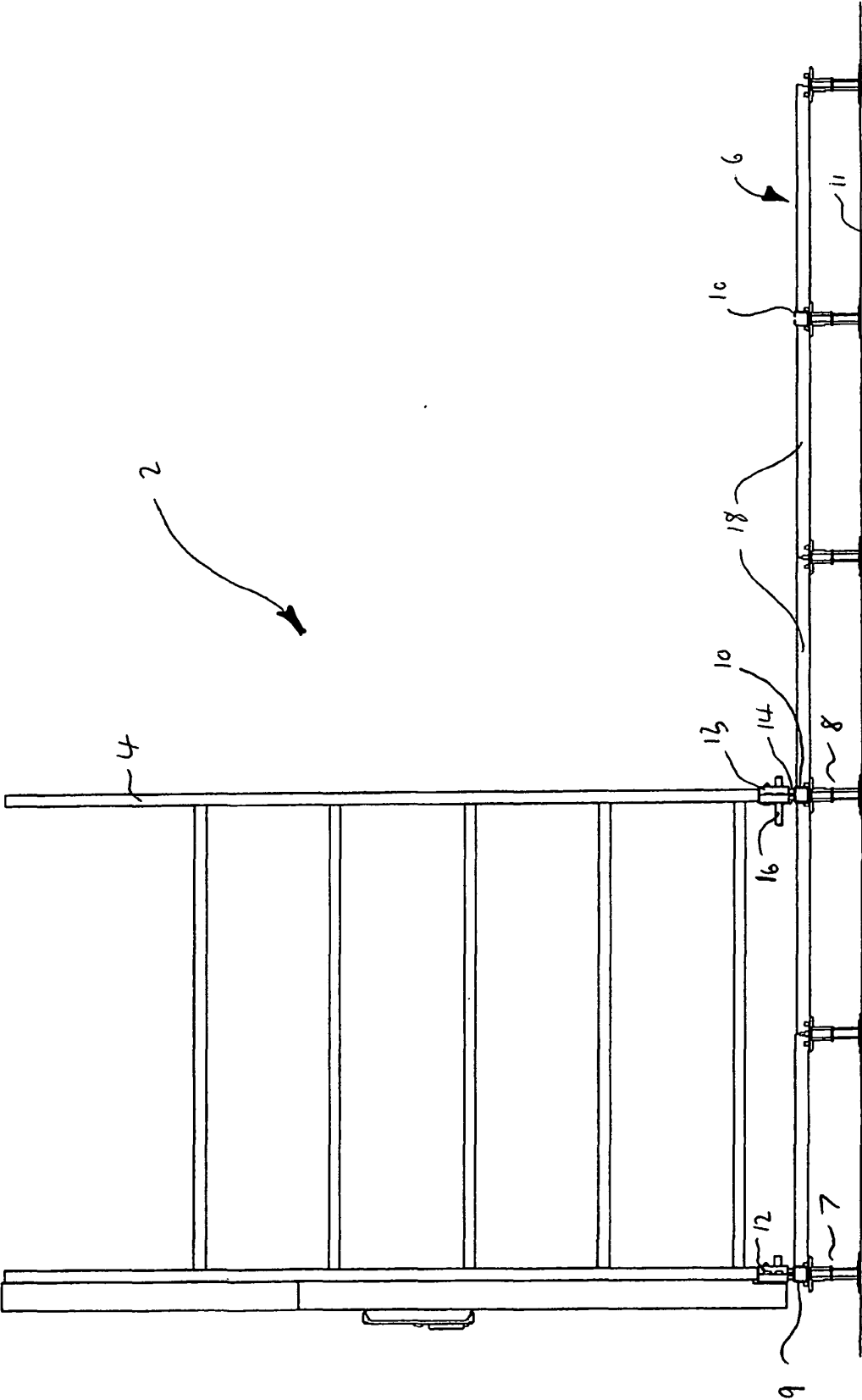


Fig. 2

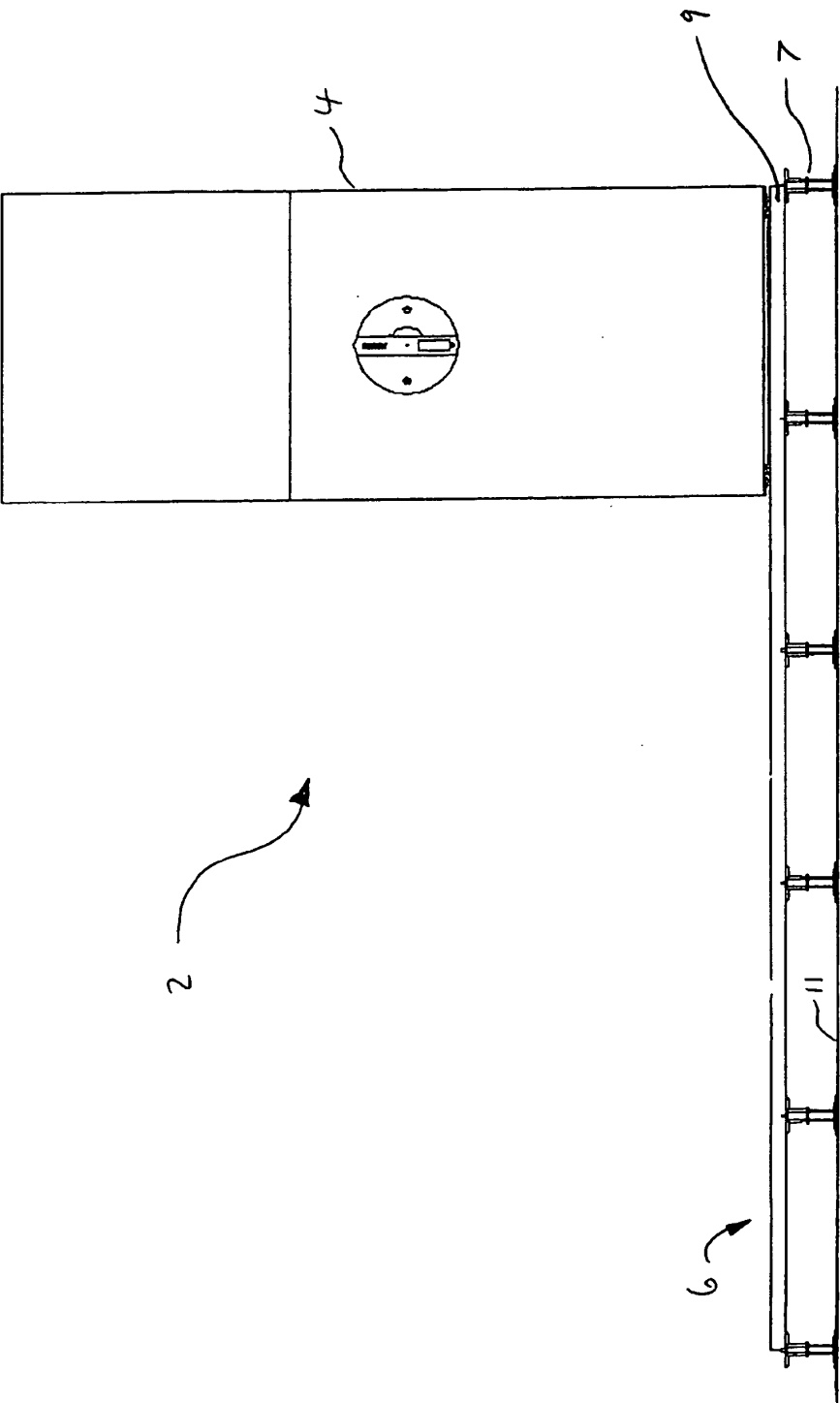


Fig. 3

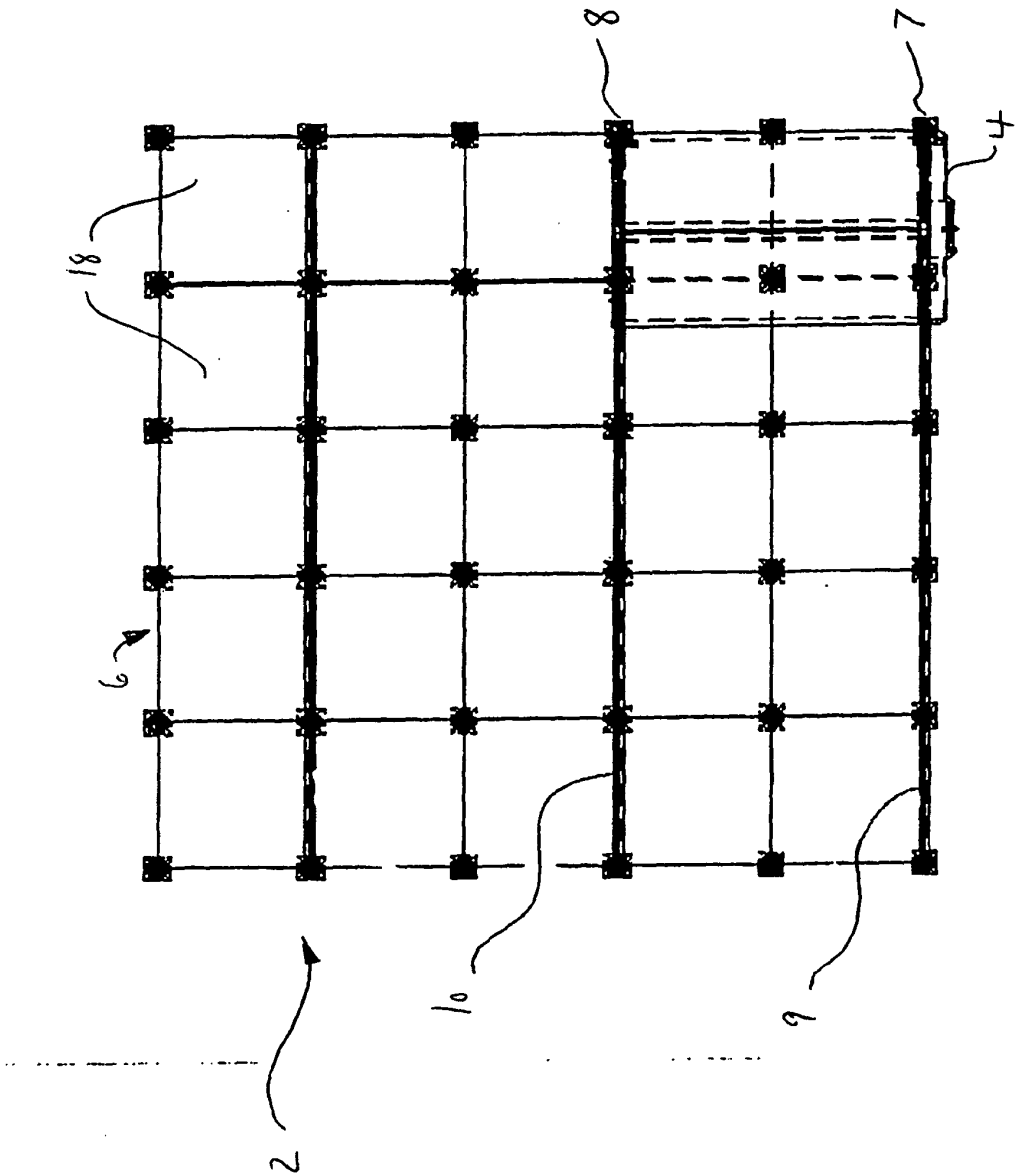


Fig. 4

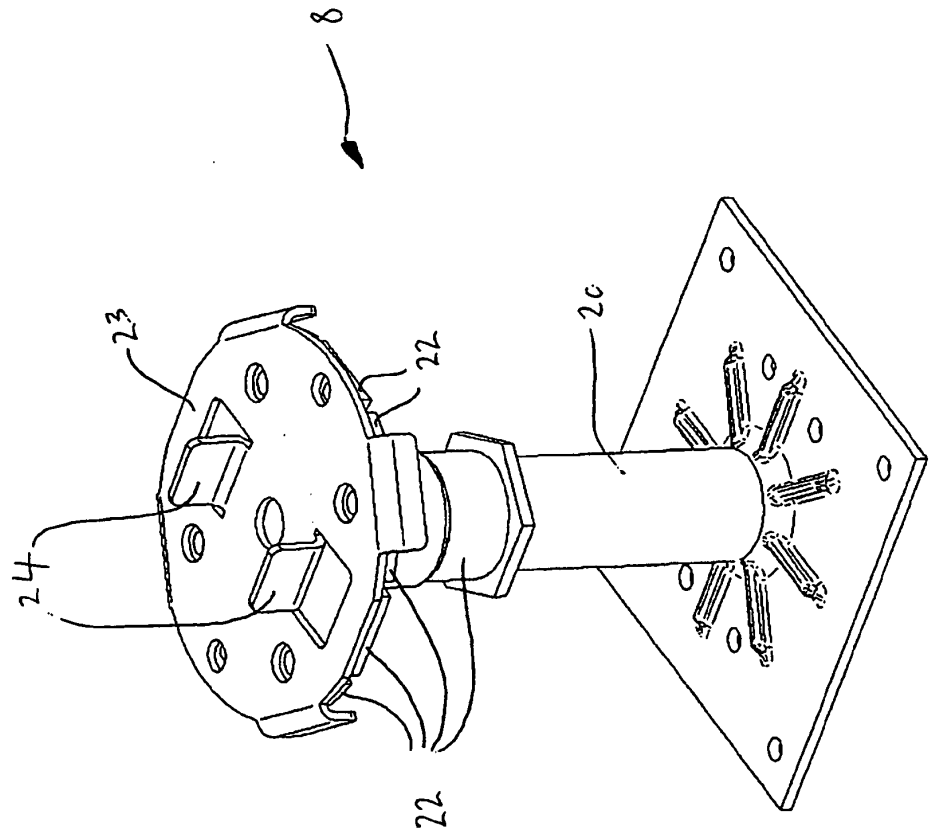


Fig. 5

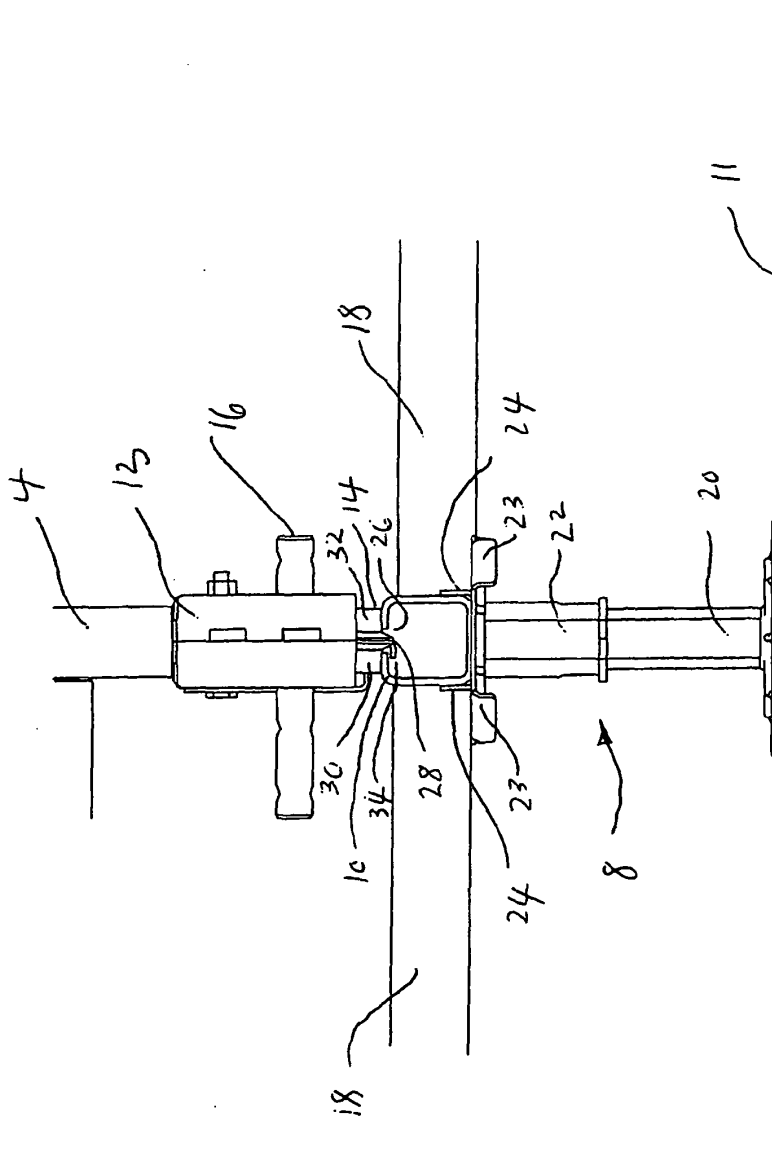


Fig. 6

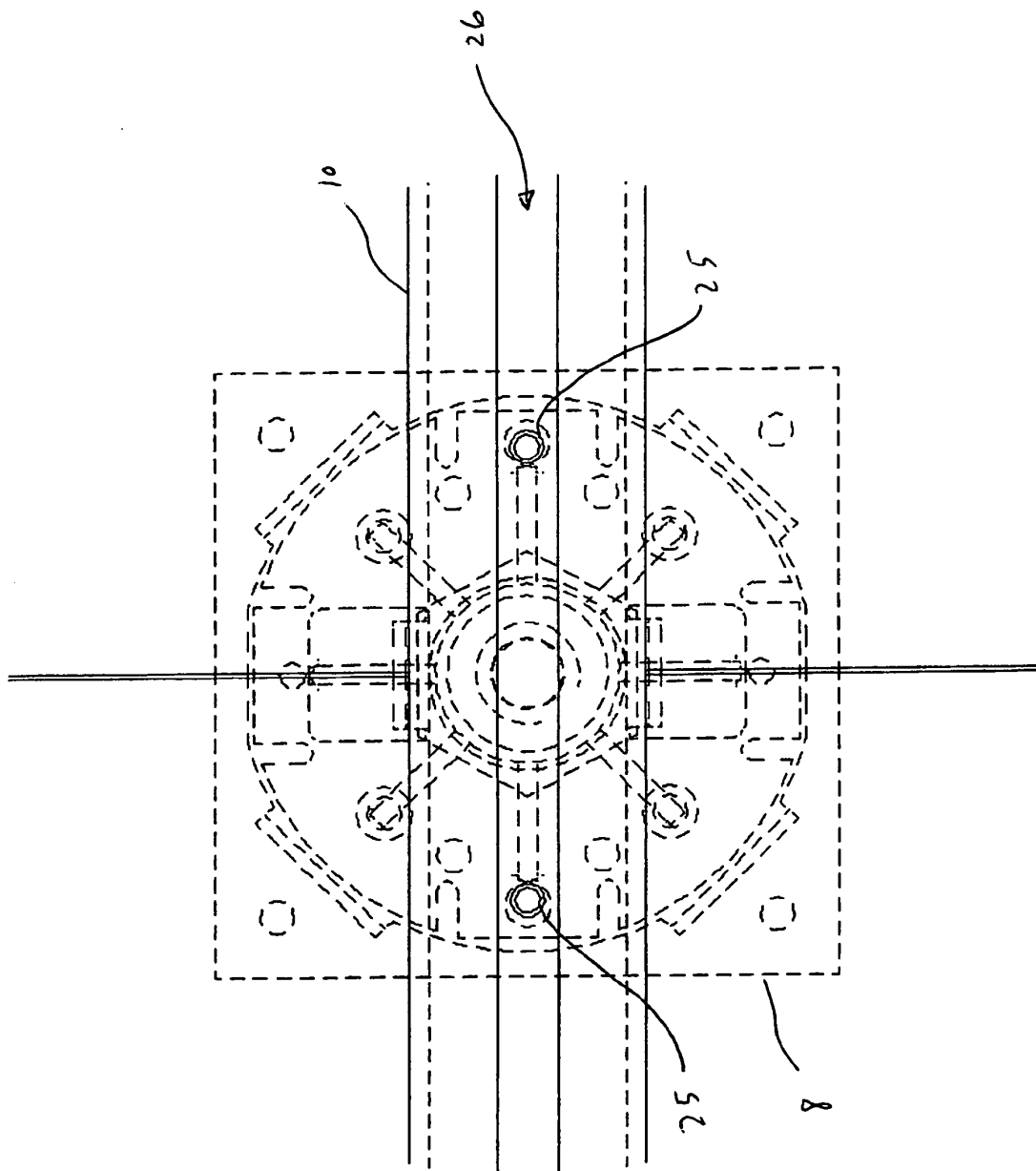


Fig. 7

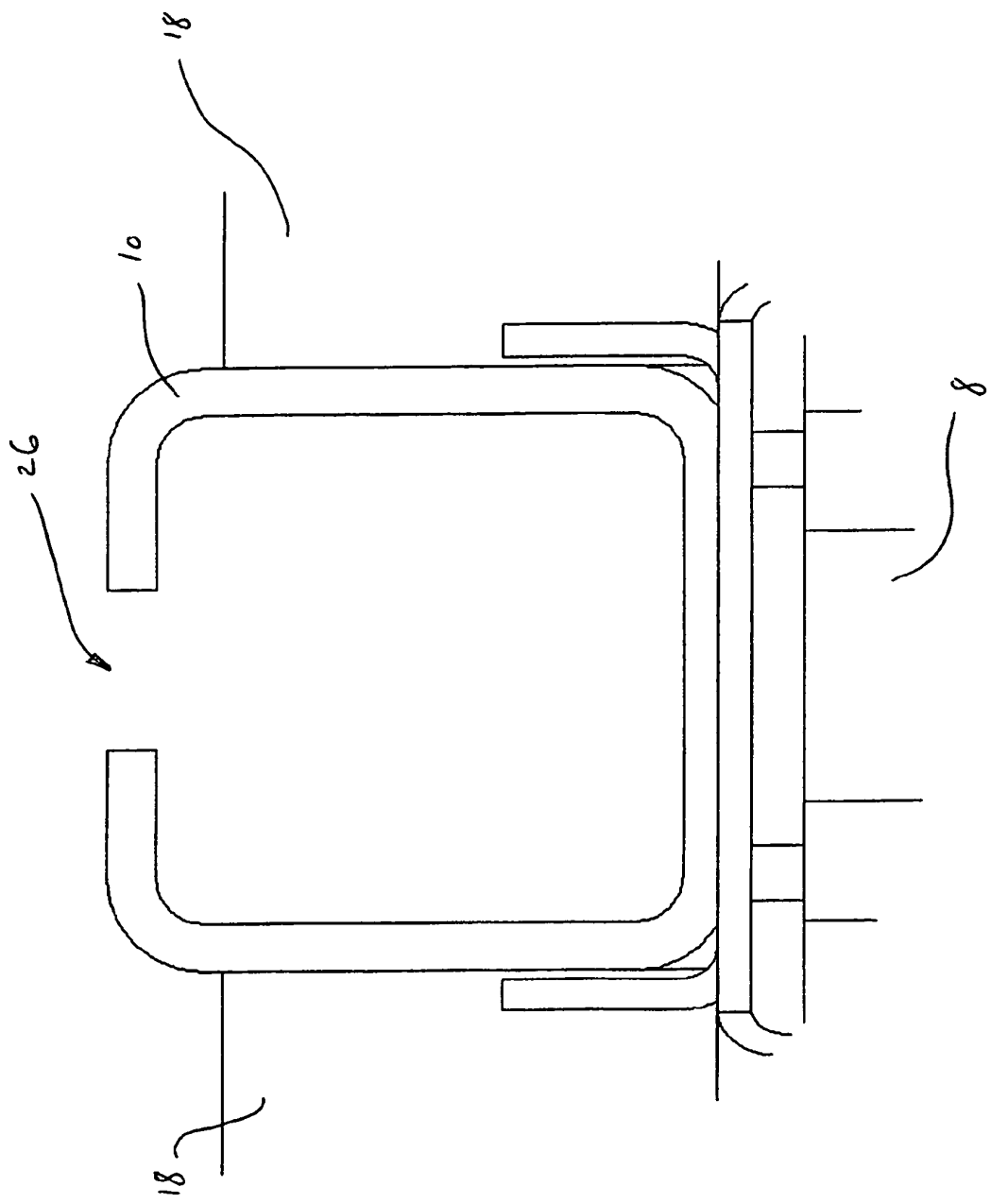


Fig. 8

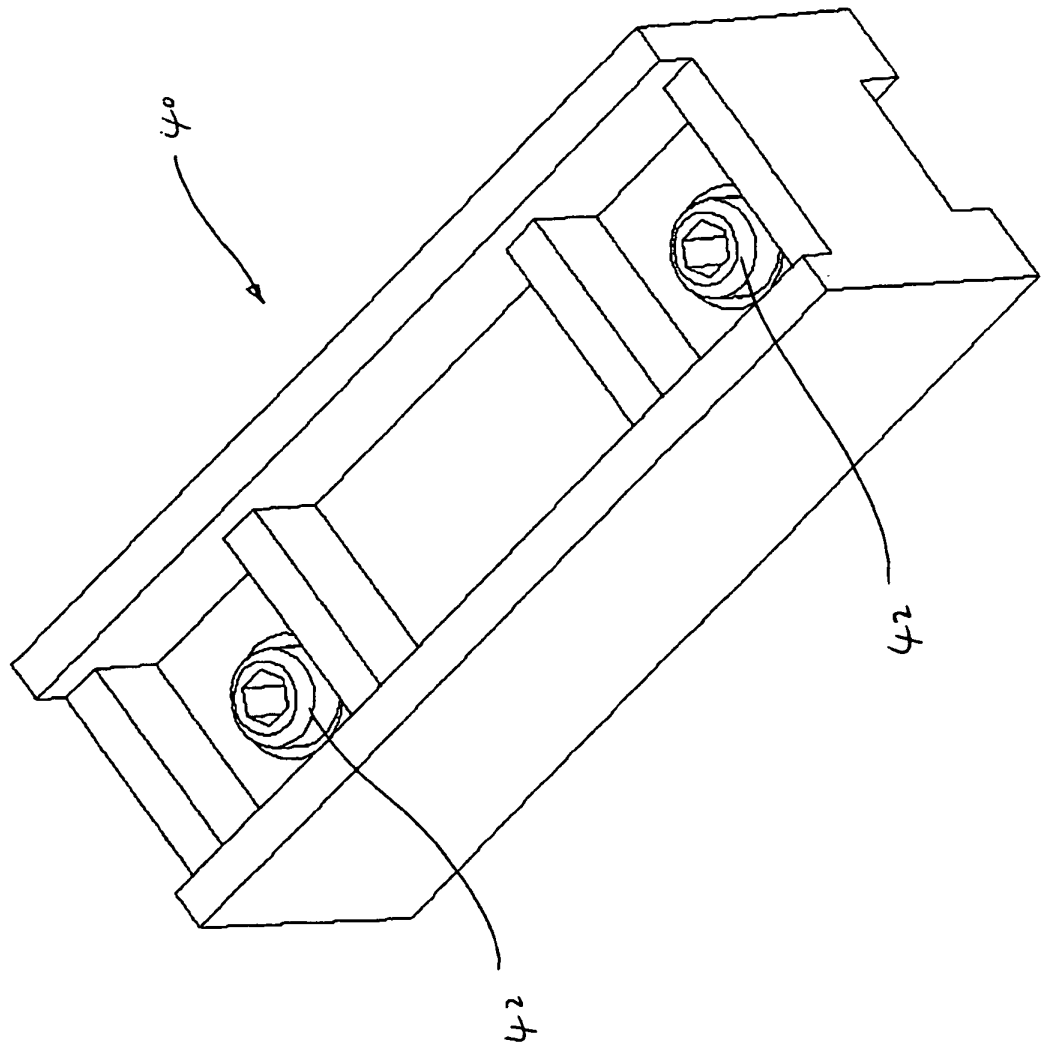
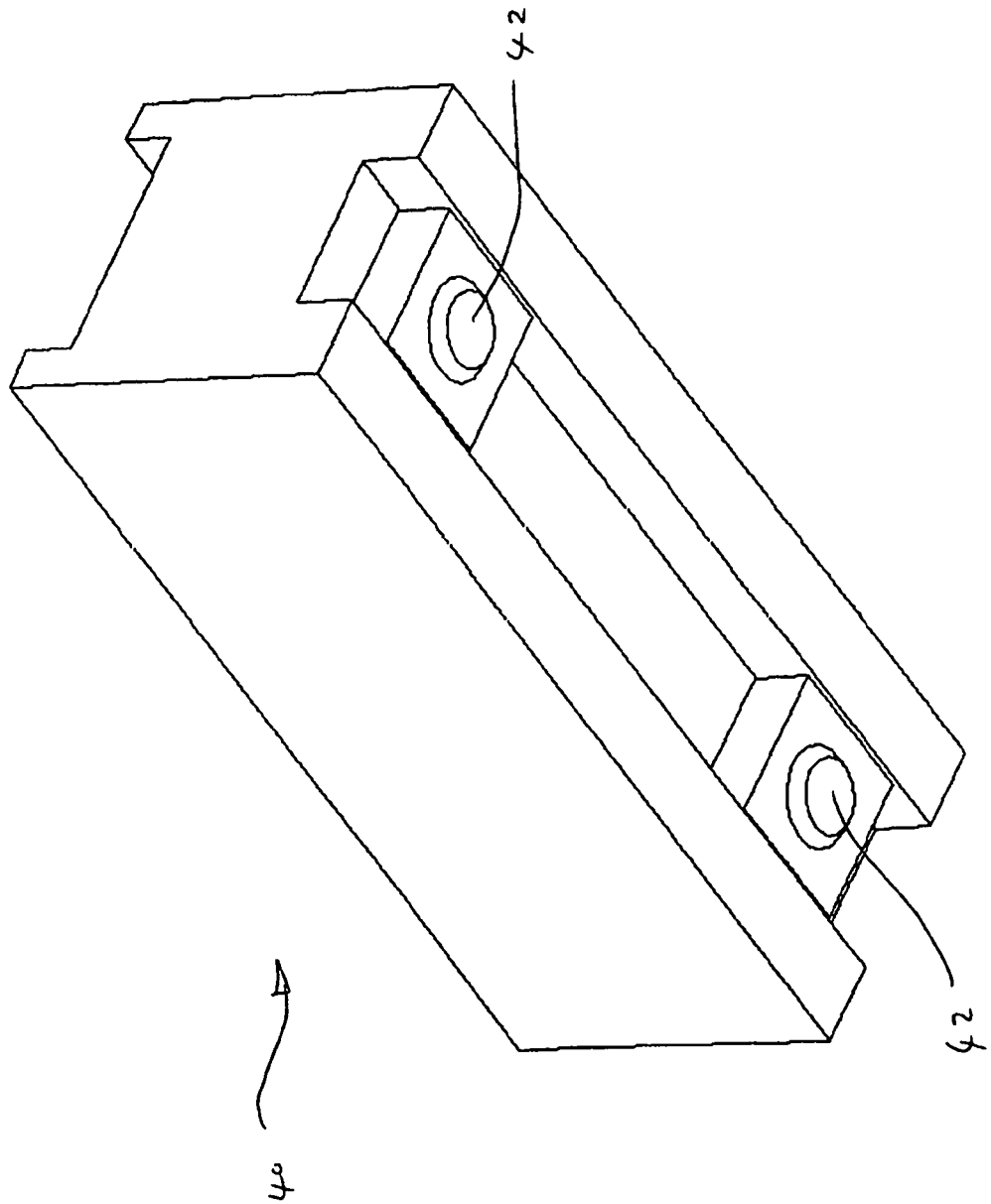
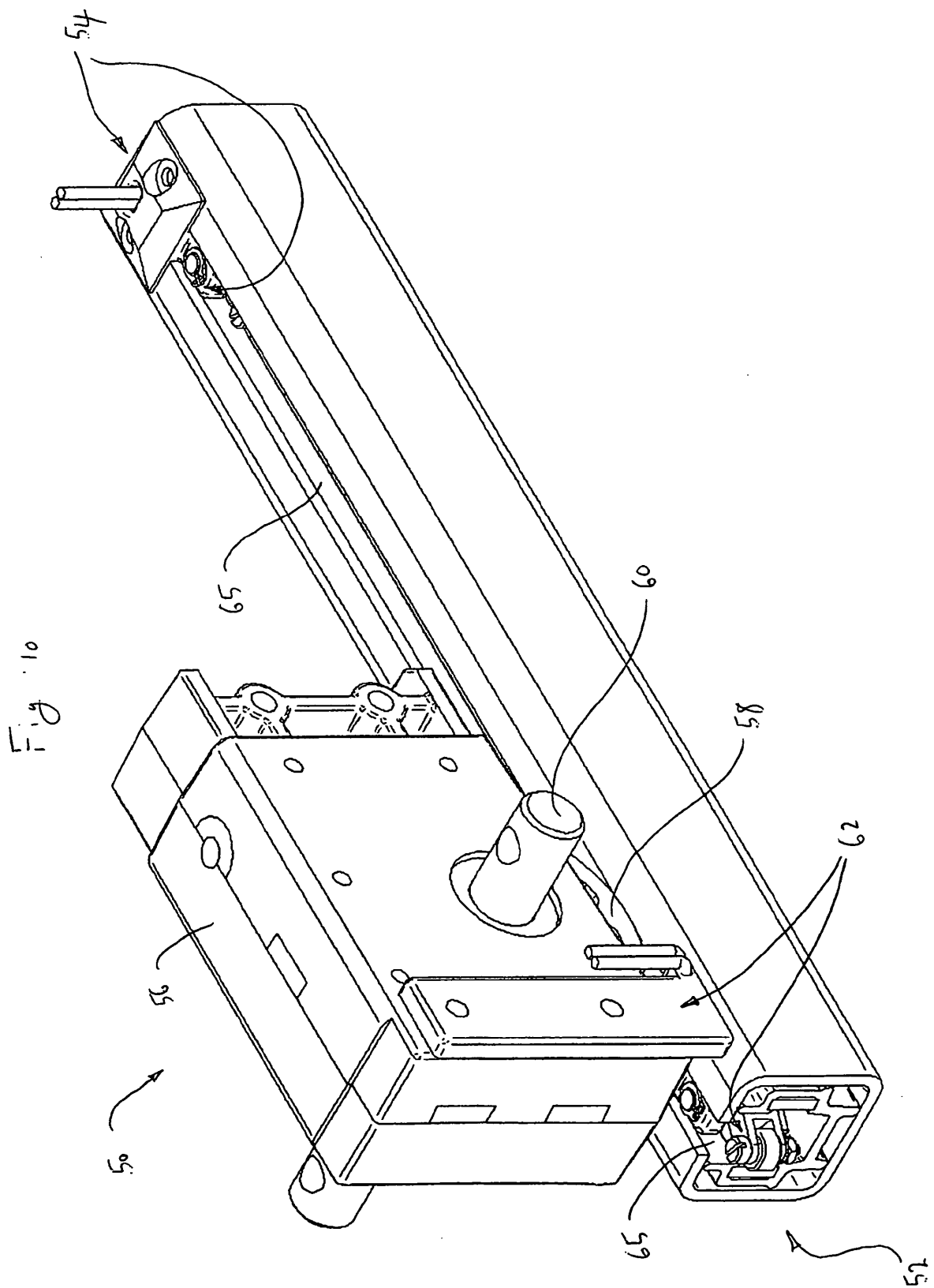
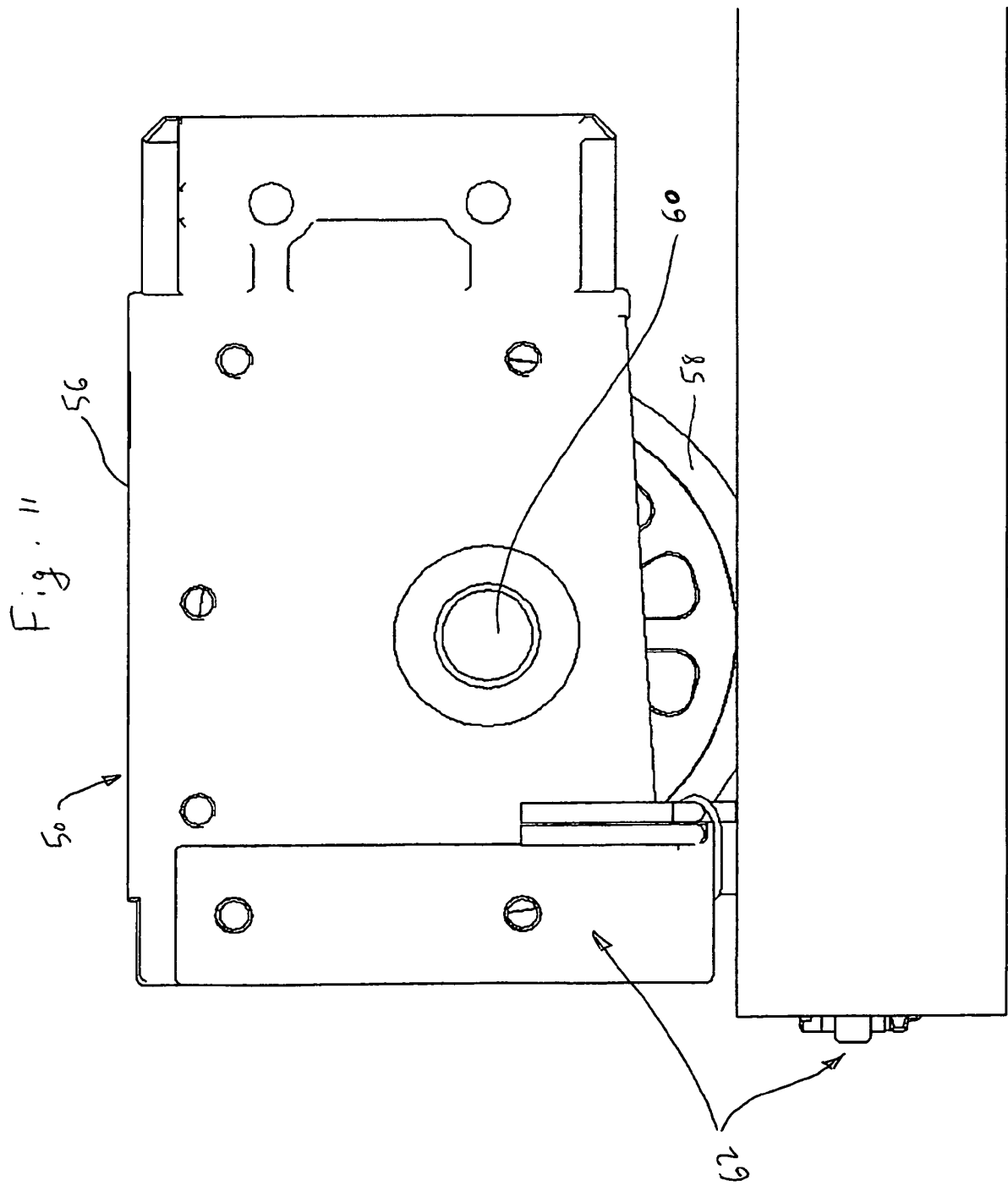


Fig. 9







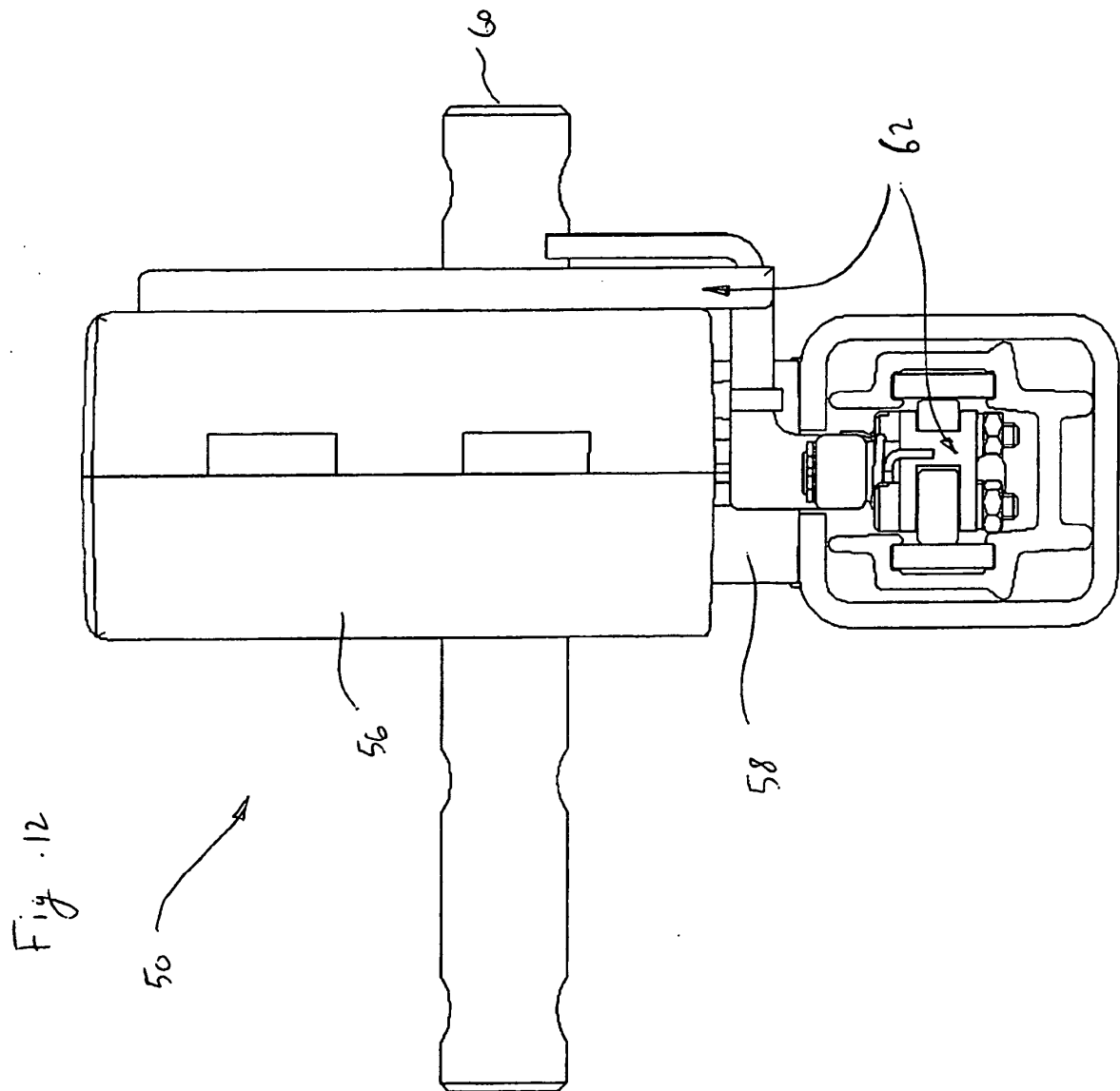


Fig. 13

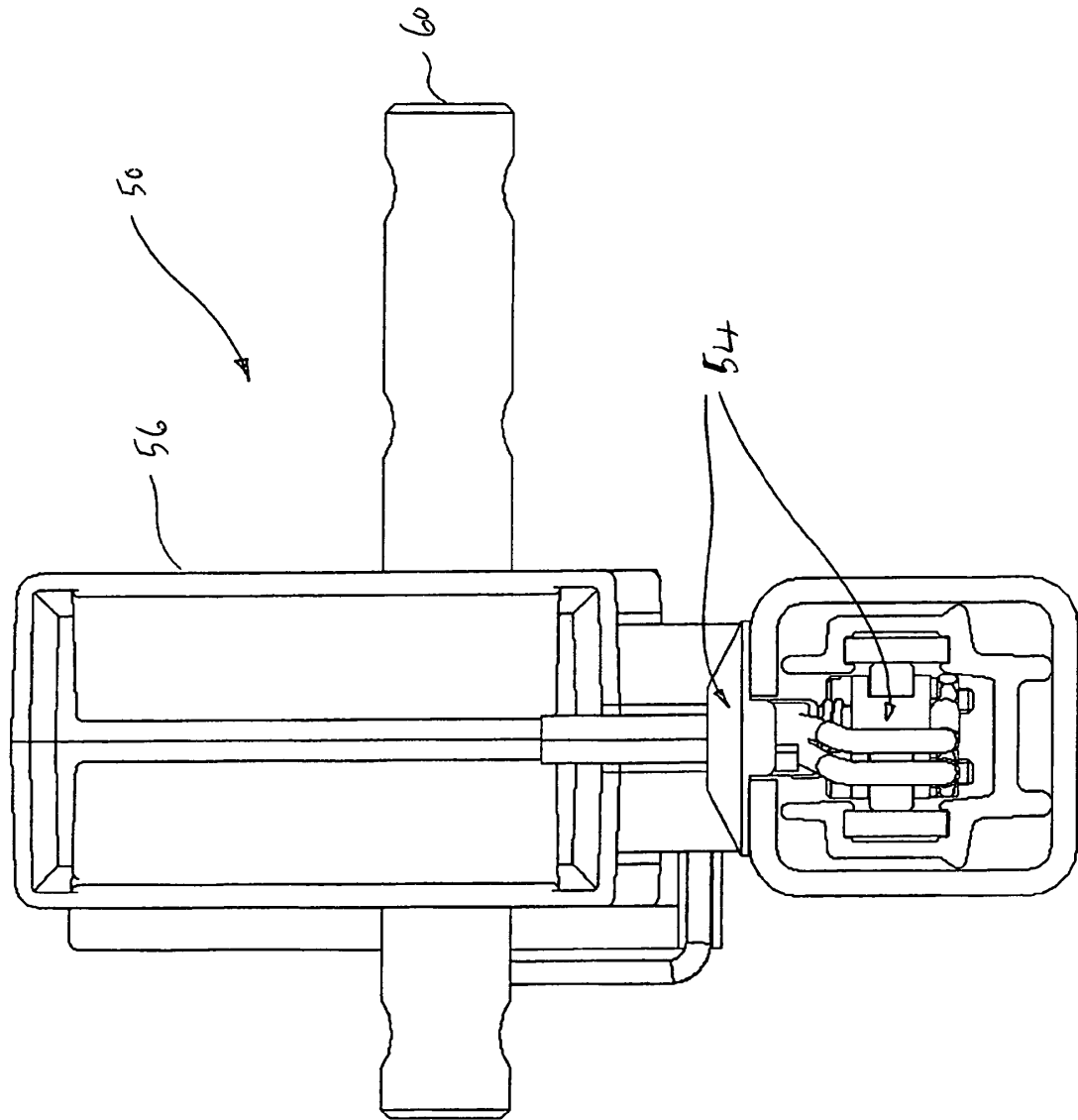


Fig. 14

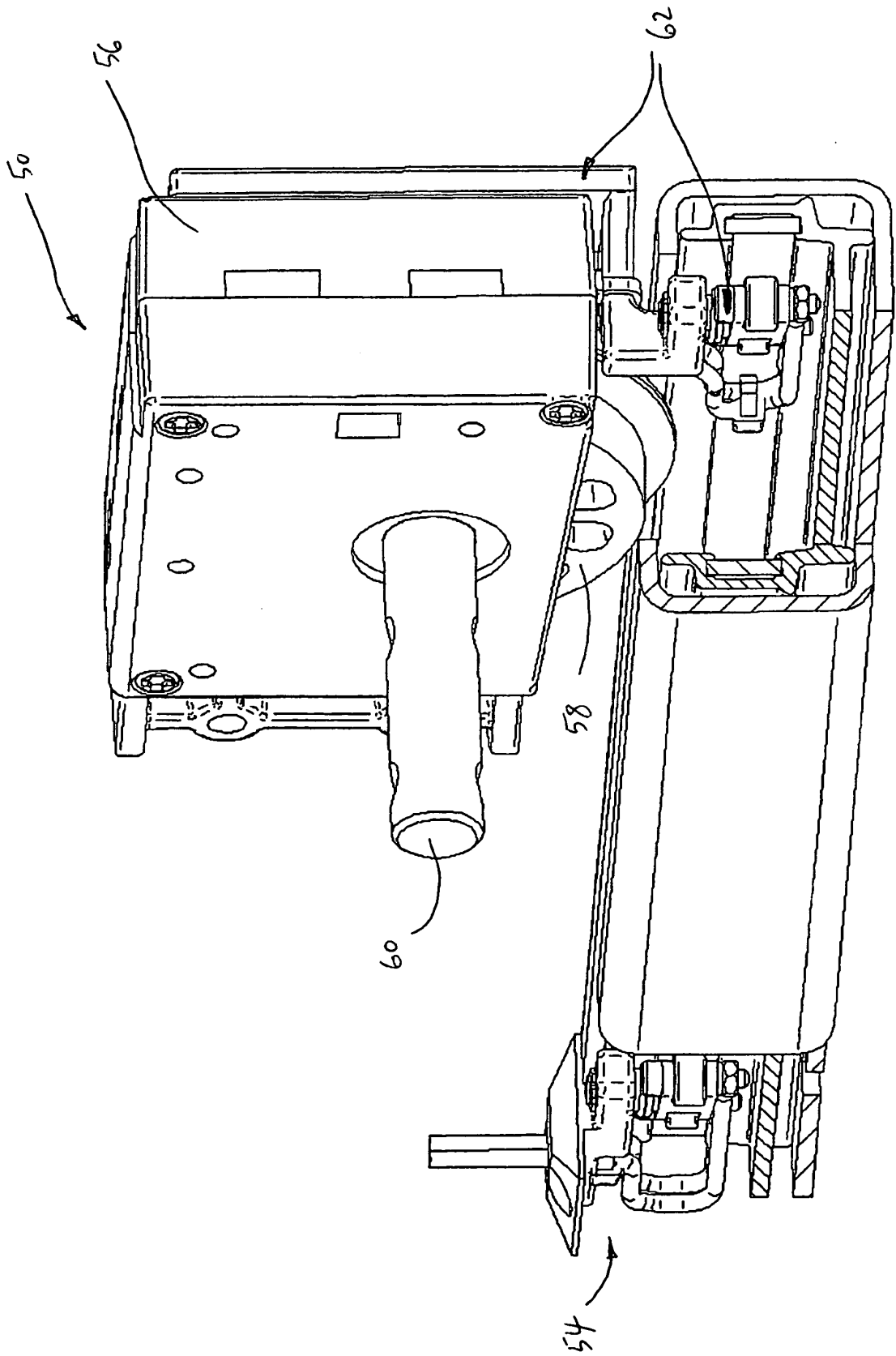


Fig. 15

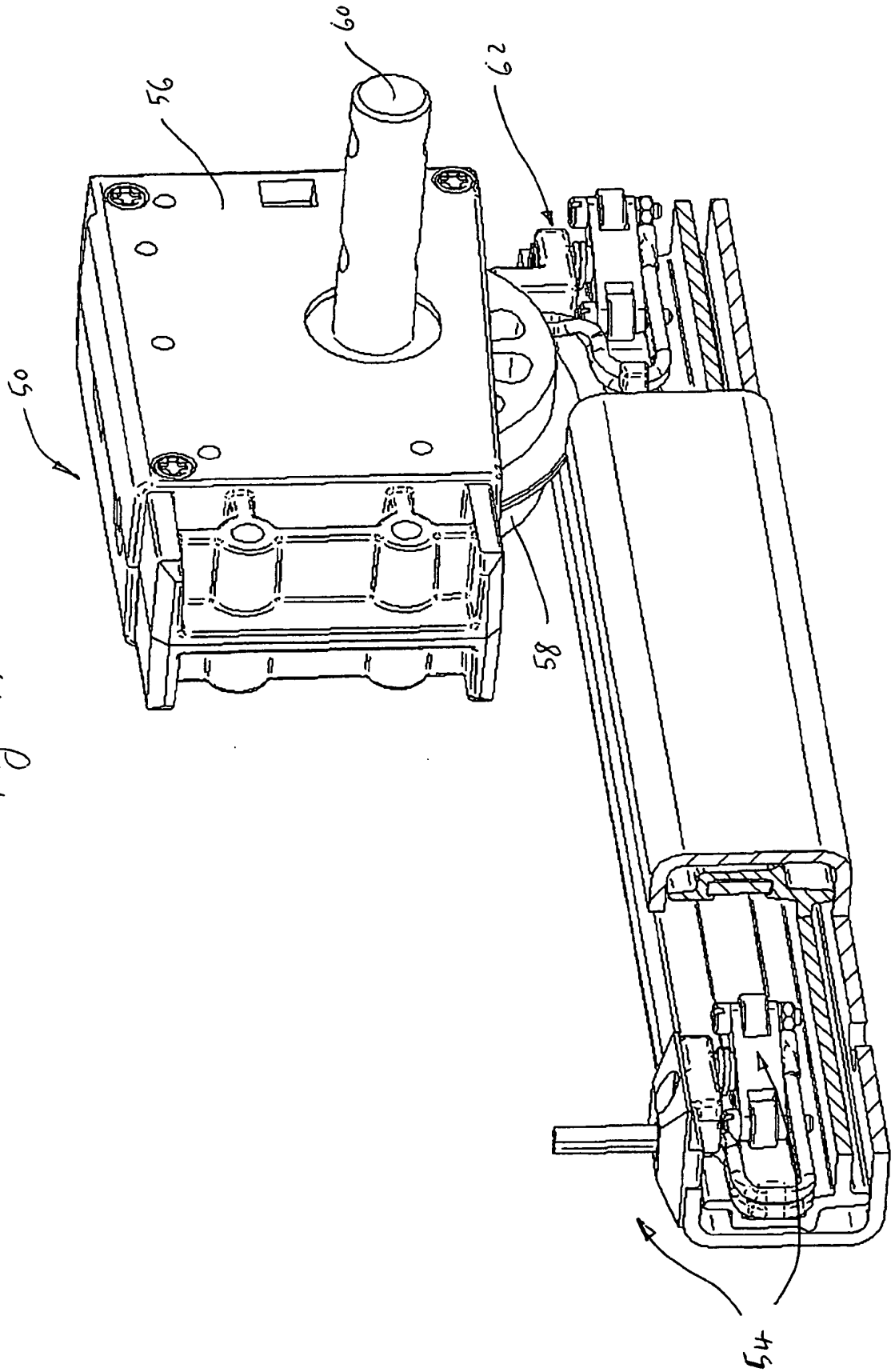


Fig. 16

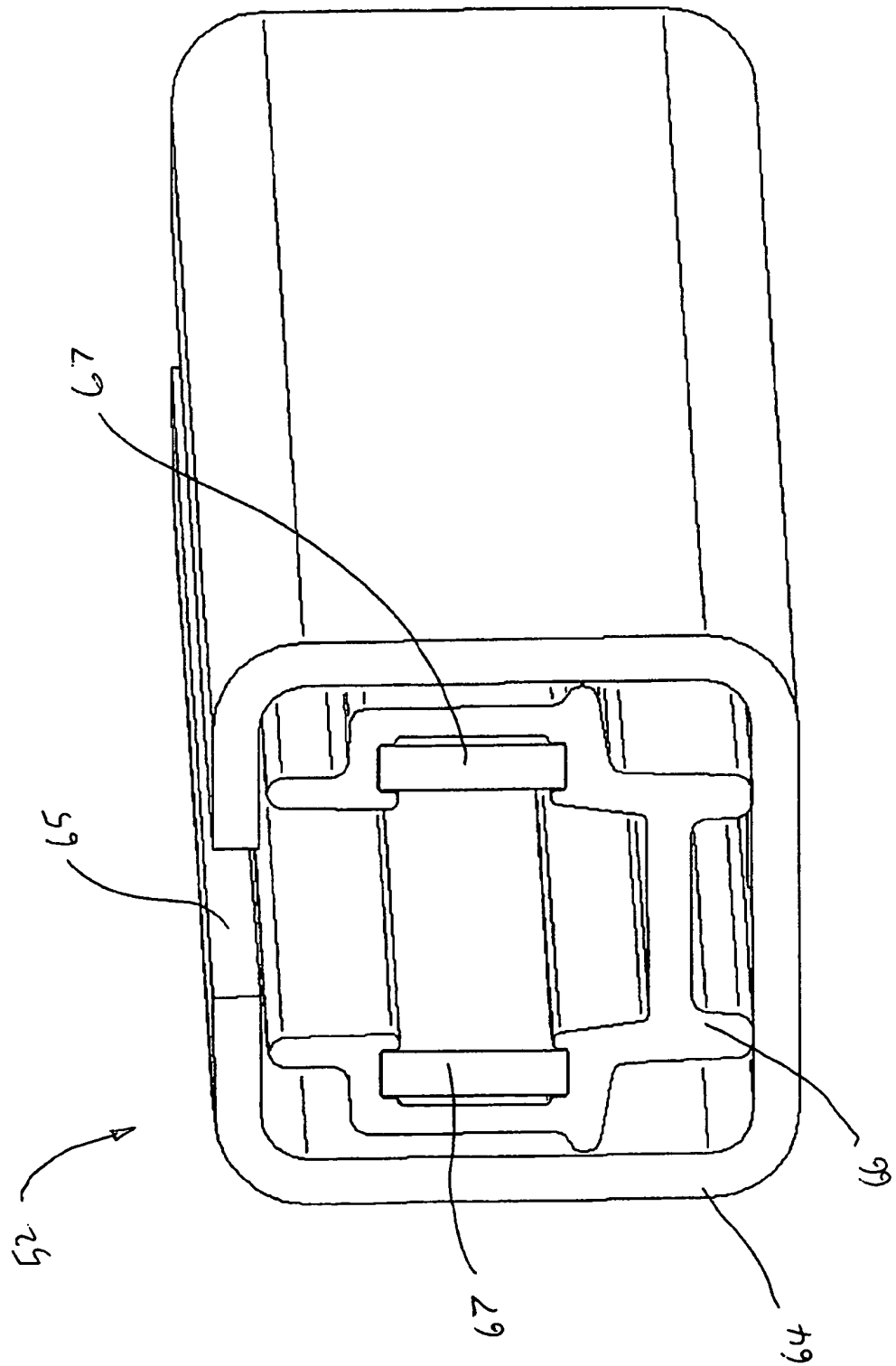


Fig. 17

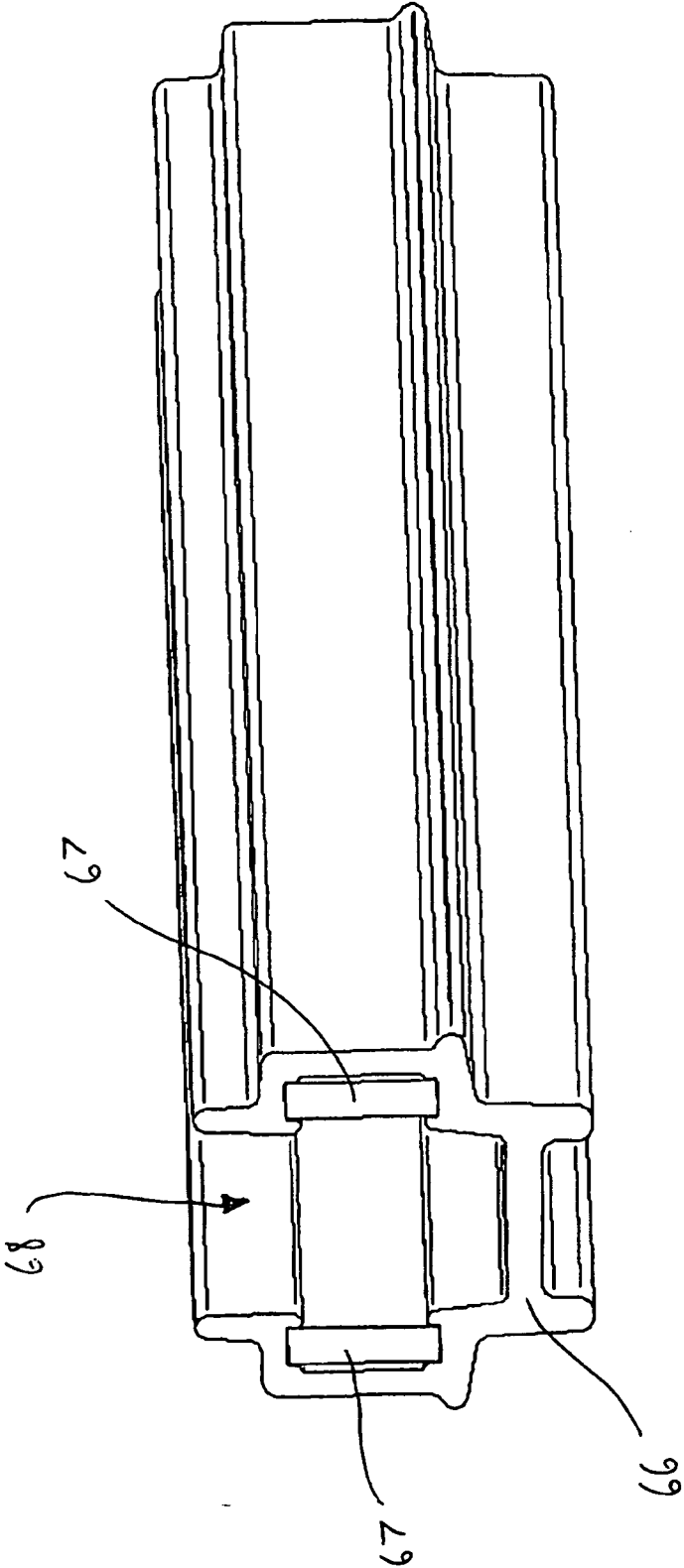
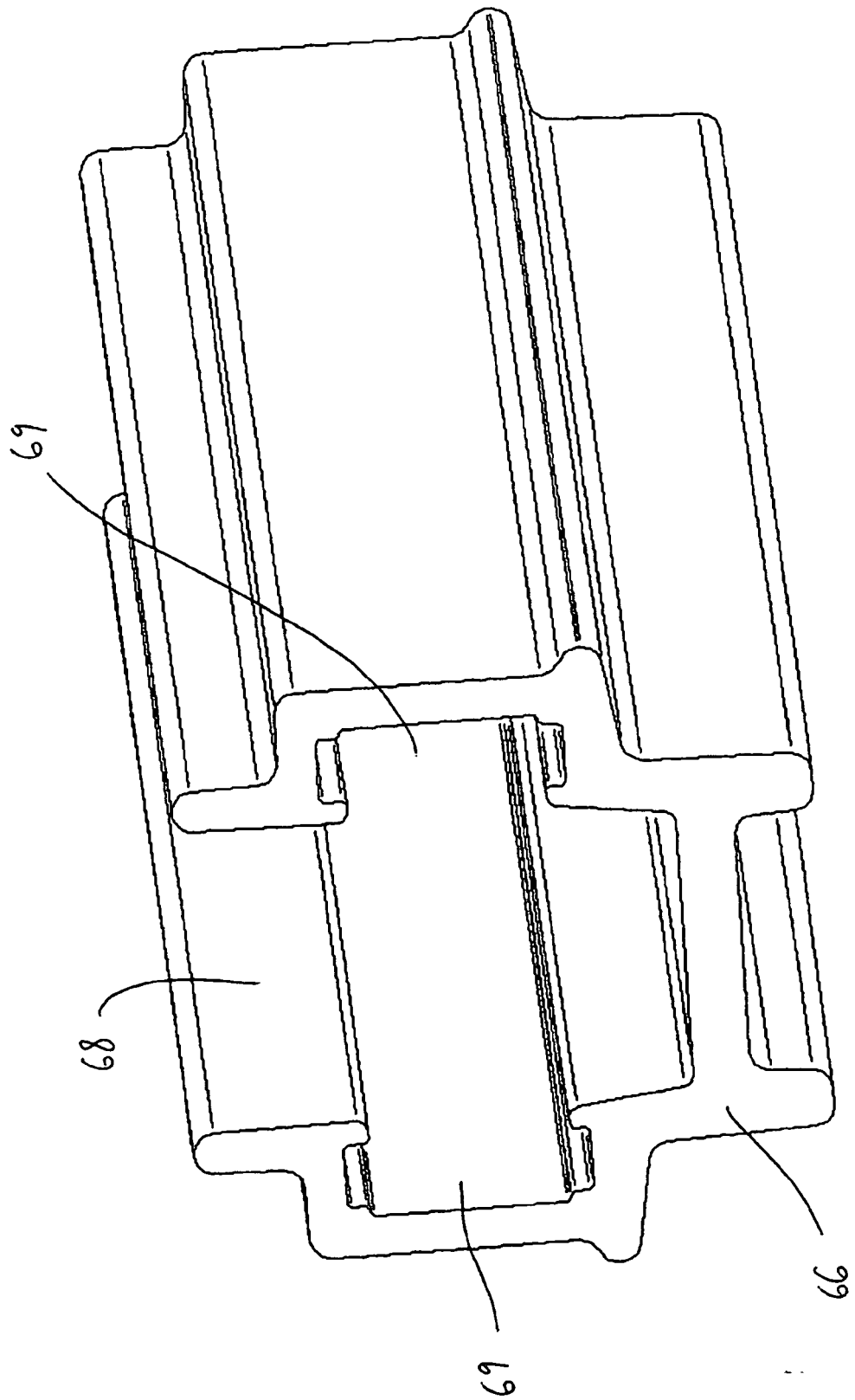
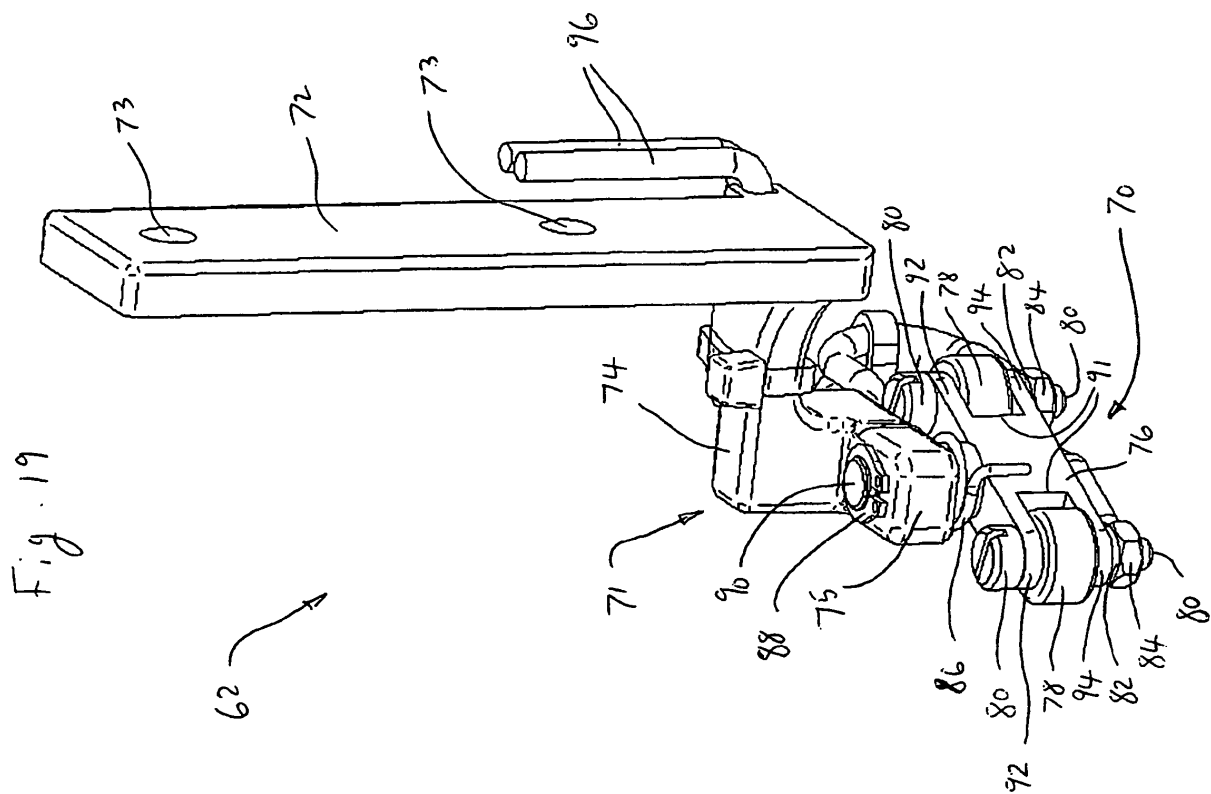


Fig. 18





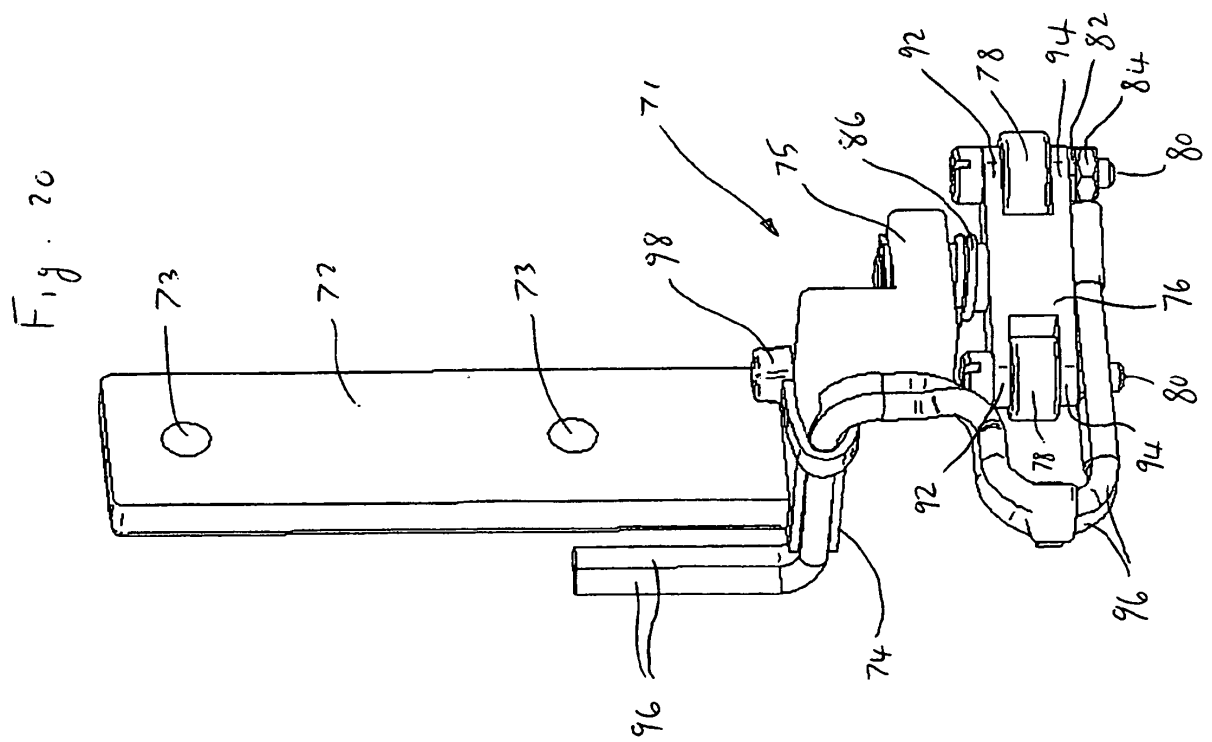


Fig. 21

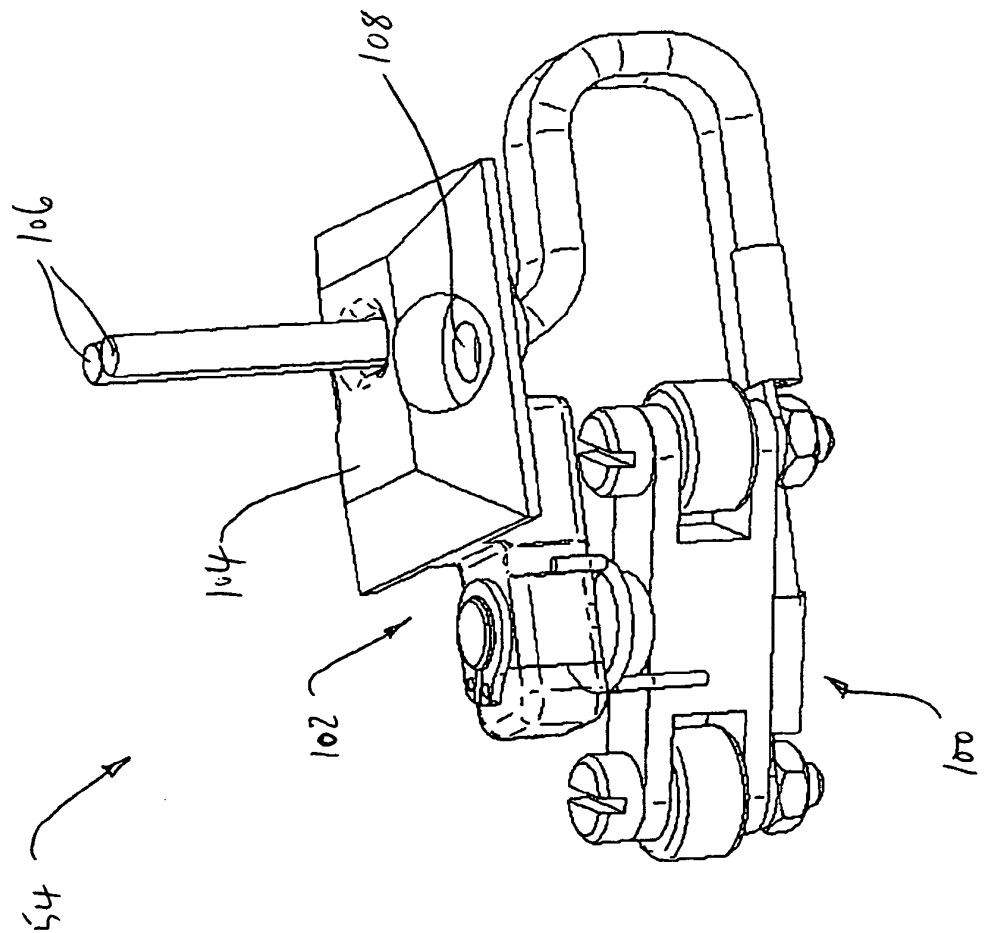
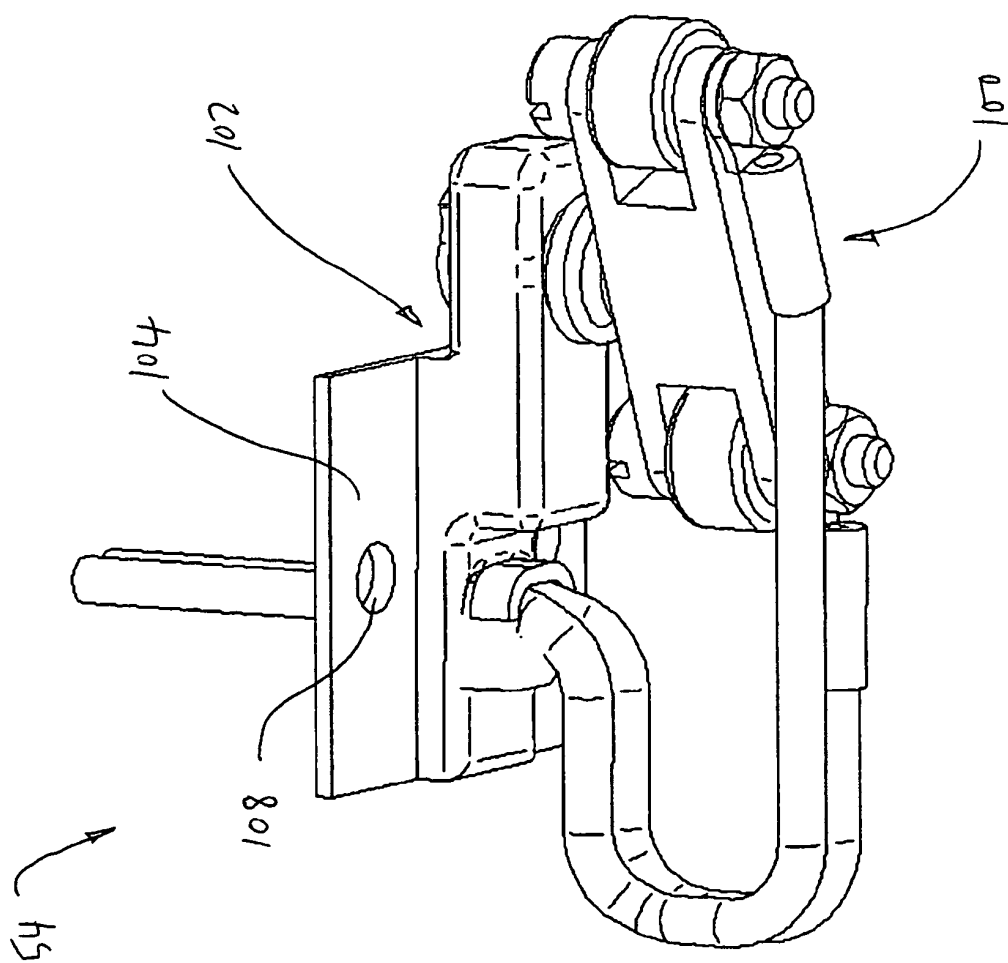


Fig. 22



REFERENCES CITED IN THE DESCRIPTION

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