



US010625867B2

(12) **United States Patent**  
**Hildom et al.**

(10) **Patent No.:** **US 10,625,867 B2**

(45) **Date of Patent:** **Apr. 21, 2020**

(54) **INTEGRABLE SEAT LEG**

(71) Applicant: **Fenton Mobility Products, Inc.**,  
Jamestown, NY (US)

(72) Inventors: **Gerald James Hildom**, Jamestown, NY  
(US); **Scott Ivan Fenton**, Sinclairville,  
NY (US)

(73) Assignee: **Fenton Mobility Products, Inc.**,  
Jamestown, NY (US)

(\*) Notice: Subject to any disclaimer, the term of this  
patent is extended or adjusted under 35  
U.S.C. 154(b) by 28 days.

(21) Appl. No.: **16/150,808**

(22) Filed: **Oct. 3, 2018**

(65) **Prior Publication Data**

US 2019/0106217 A1 Apr. 11, 2019

**Related U.S. Application Data**

(60) Provisional application No. 62/568,577, filed on Oct.  
5, 2017.

(51) **Int. Cl.**

**B64D 25/04** (2006.01)  
**B64D 11/06** (2006.01)  
**B60N 2/015** (2006.01)  
**B64C 1/18** (2006.01)  
**B60N 2/68** (2006.01)

(52) **U.S. Cl.**

CPC ..... **B64D 11/0696** (2013.01); **B60N 2/015**  
(2013.01); **B60N 2/01575** (2013.01); **B60N**  
**2/01583** (2013.01); **B60N 2/68** (2013.01);  
**B64C 1/18** (2013.01)

(58) **Field of Classification Search**

CPC ..... B64D 11/0696; B64D 11/06  
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,229,040 A \* 10/1980 Howell ..... B64D 11/0648  
297/440.1  
4,375,300 A \* 3/1983 Long ..... B60N 2/242  
244/122 R  
4,771,969 A 9/1988 Dowd  
4,796,837 A \* 1/1989 Dowd ..... B64D 11/0696  
244/122 R  
4,856,738 A \* 8/1989 Martin ..... B64D 11/0696  
244/122 R  
4,878,640 A \* 11/1989 Fricker ..... E04B 1/4107  
248/297.21  
4,911,381 A \* 3/1990 Cannon ..... B64D 11/0696  
244/122 R

(Continued)

FOREIGN PATENT DOCUMENTS

CA 2315950 2/2001

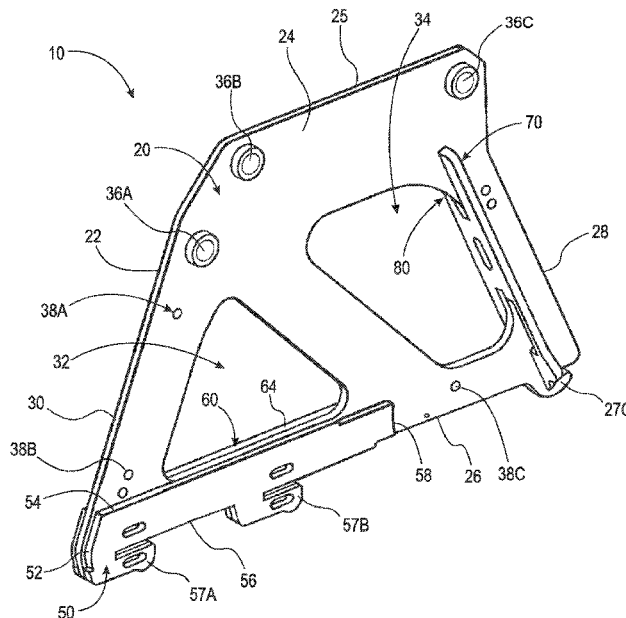
*Primary Examiner* — Shin H Kim

(74) *Attorney, Agent, or Firm* — Simpson & Simpson,  
PLLC

(57) **ABSTRACT**

An integrable seat leg for an original equipment manufac-  
turer seat, including a vertical member, including a front end  
and a rear end, a first side surface and a second side surface,  
a top surface and a bottom surface, one or more engaging  
members extending from the bottom surface, and one or  
more through-bores arranged proximate the top surface to  
secure the integrable seat leg to the seat, wherein the one or  
more engaging members are operatively arranged to engage  
one or more respective apertures in track.

**20 Claims, 8 Drawing Sheets**



(56)

References Cited

U.S. PATENT DOCUMENTS

4,936,527	A *	6/1990	Gorges	B64C 1/20	2001/0047974	A1 *	12/2001	Berlingieri	A47F 5/08
				104/165					211/106
5,083,726	A	1/1992	Schurr		2003/0085322	A1 *	5/2003	Weekly	B64D 11/06
5,178,346	A *	1/1993	Beroth	B64D 9/003					244/118.5
				244/118.1	2005/0211836	A1 *	9/2005	Frantz	B64C 1/20
5,522,640	A *	6/1996	Bilezikjian	B60N 2/4214					244/118.6
				188/377	2006/0097109	A1 *	5/2006	Laib	B64D 11/0696
6,786,340	B2 *	9/2004	Ford	A47F 5/0815					244/118.6
				211/103	2006/0263164	A1 *	11/2006	Dowty	B64D 11/0696
6,846,044	B2	1/2005	Moffa et al.						410/105
7,029,215	B2 *	4/2006	Dowty	B64D 11/0696	2007/0026707	A1 *	2/2007	Pozzi	B60N 2/0825
				410/102					439/157
7,370,832	B2 *	5/2008	Frantz	B64C 1/20	2007/0063122	A1 *	3/2007	Bowd	B64C 1/20
				244/118.6					248/429
7,695,225	B2 *	4/2010	Pozzi	B60N 2/0825	2010/0096502	A1 *	4/2010	VanderWolk	B64D 11/0696
				410/104					244/122 R
7,857,259	B2 *	12/2010	Baatz	B64C 1/20	2010/0108808	A1 *	5/2010	Allain	B64D 11/0696
				244/118.6					244/118.6
7,975,979	B2	7/2011	Bishop		2011/0062286	A1 *	3/2011	Pinkal	B64D 11/0696
8,528,860	B2 *	9/2013	VanderWolk	B64D 11/0696					244/122 R
				244/118.5	2011/0233337	A1 *	9/2011	Pozzi	B64C 1/18
9,284,056	B2 *	3/2016	Mejuhas	B64D 11/0696					244/122 R
9,622,595	B2 *	4/2017	Kozak	G09F 3/204	2014/0042273	A1 *	2/2014	Day	B64D 11/0696
9,637,026	B2	5/2017	Cardone et al.						244/122 R
9,718,552	B2 *	8/2017	Zheng	B64D 11/0648	2016/0023769	A1 *	1/2016	Zheng	B64D 11/0648
9,878,639	B2 *	1/2018	Sawdy	B60N 2/01525					297/452.18
9,919,803	B2 *	3/2018	Pozzi	B64D 11/0636	2016/0107542	A1 *	4/2016	Trimble	B60N 2/01575
									296/65.03
					2017/0190408	A1 *	7/2017	Burd	B64D 11/04
					2019/0092478	A1 *	3/2019	Gilbert	B64C 1/20
					2019/0106217	A1 *	4/2019	Hildom	B64D 11/0696

\* cited by examiner

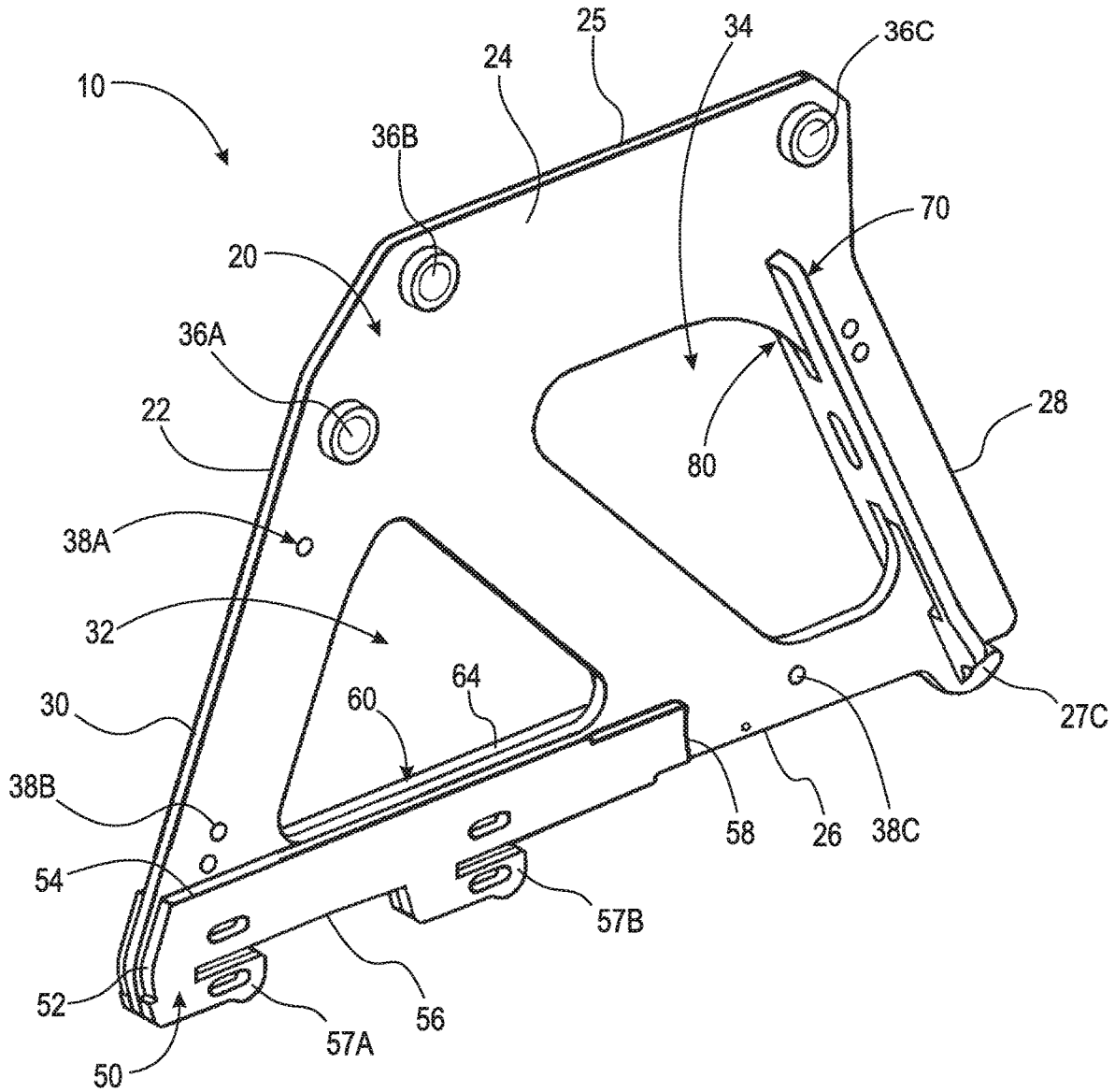


Fig. 1

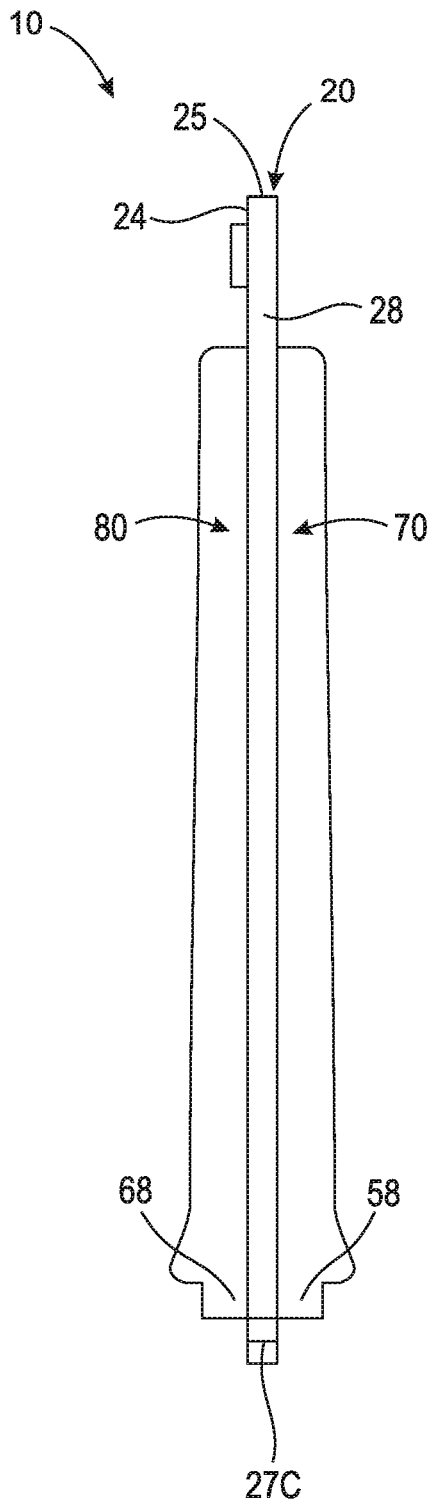


Fig. 2A

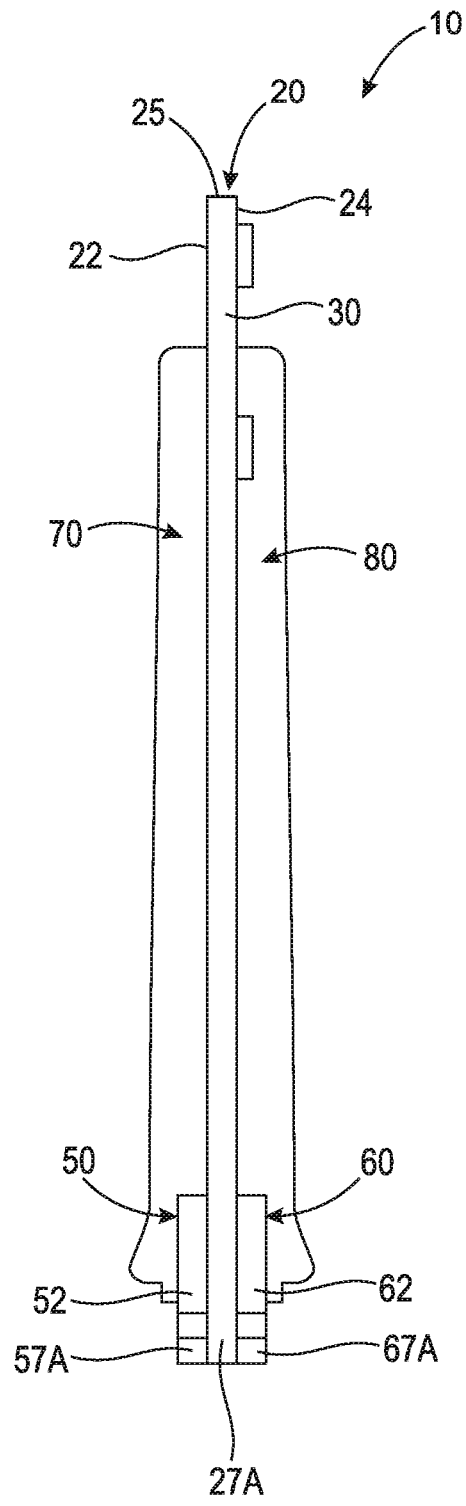


Fig. 2B

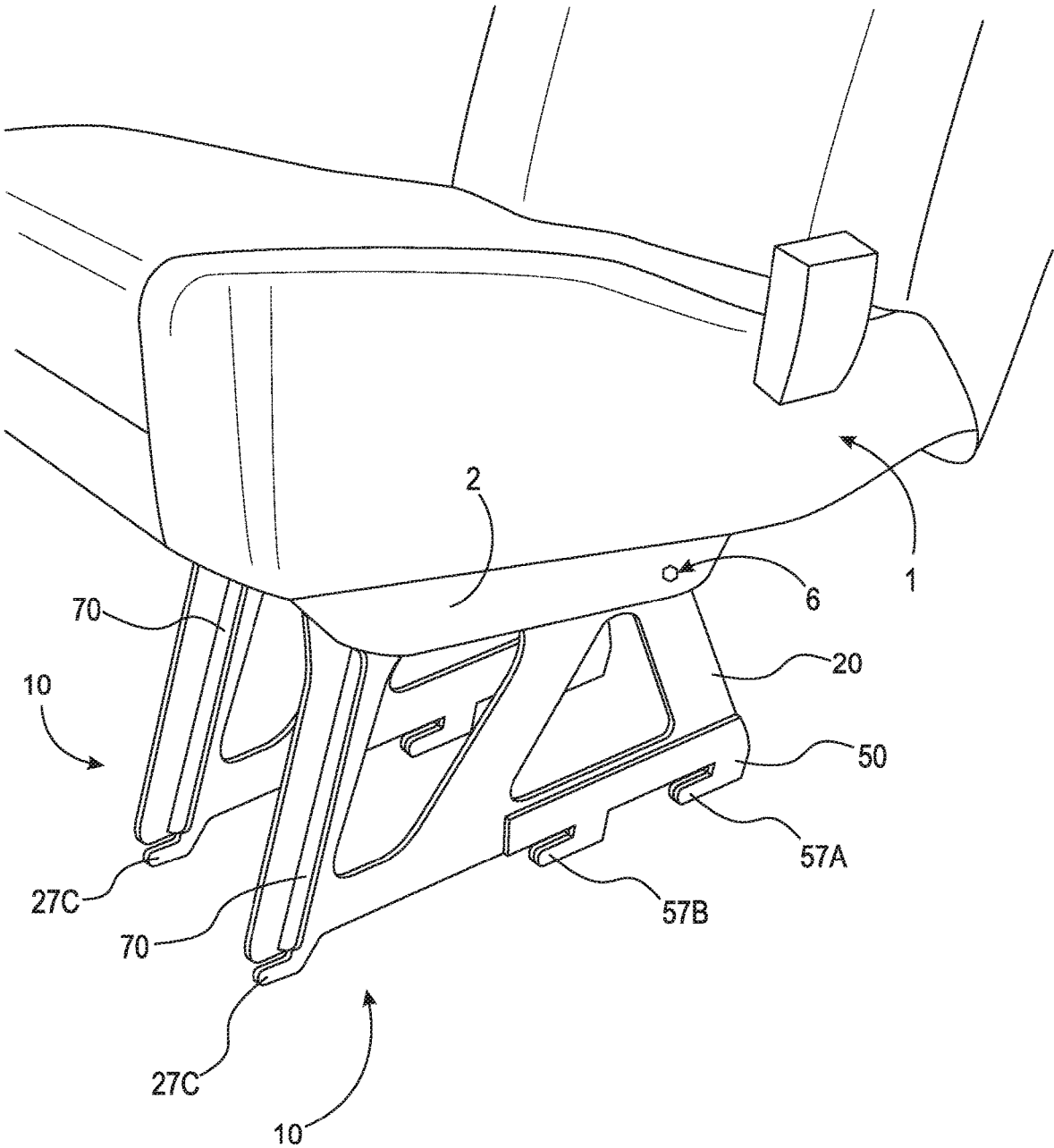


Fig. 3

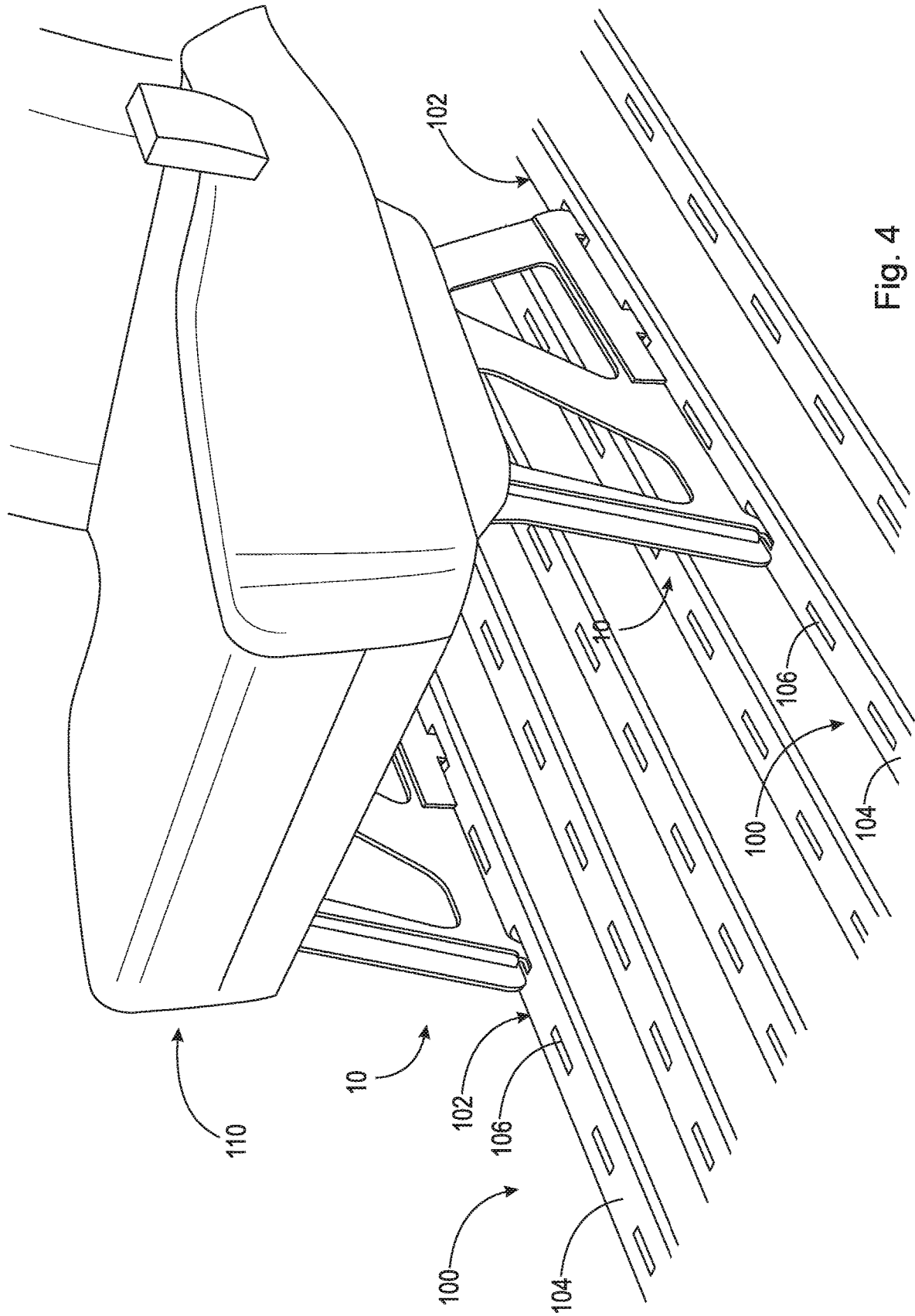


Fig. 4

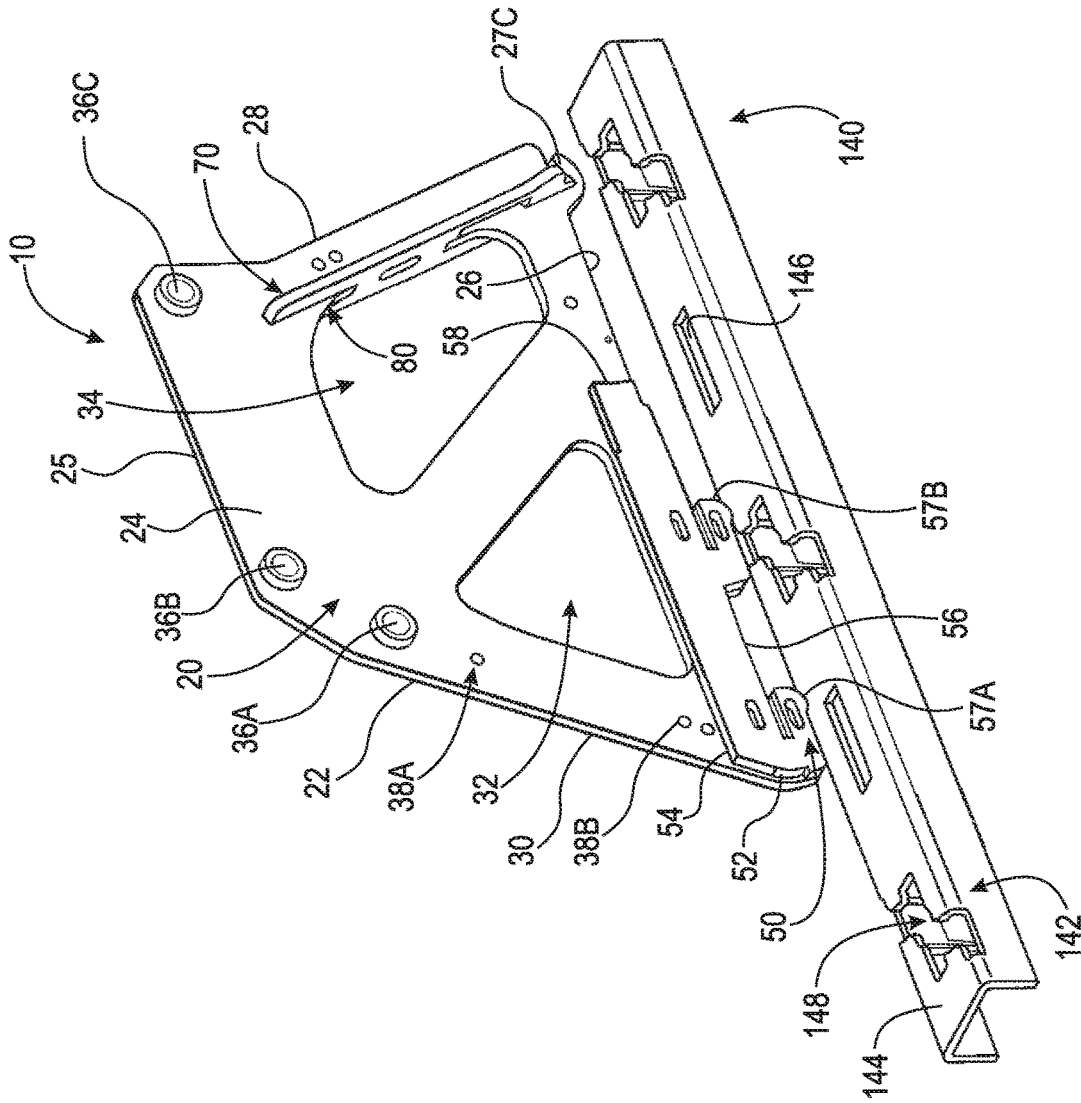


Fig. 5

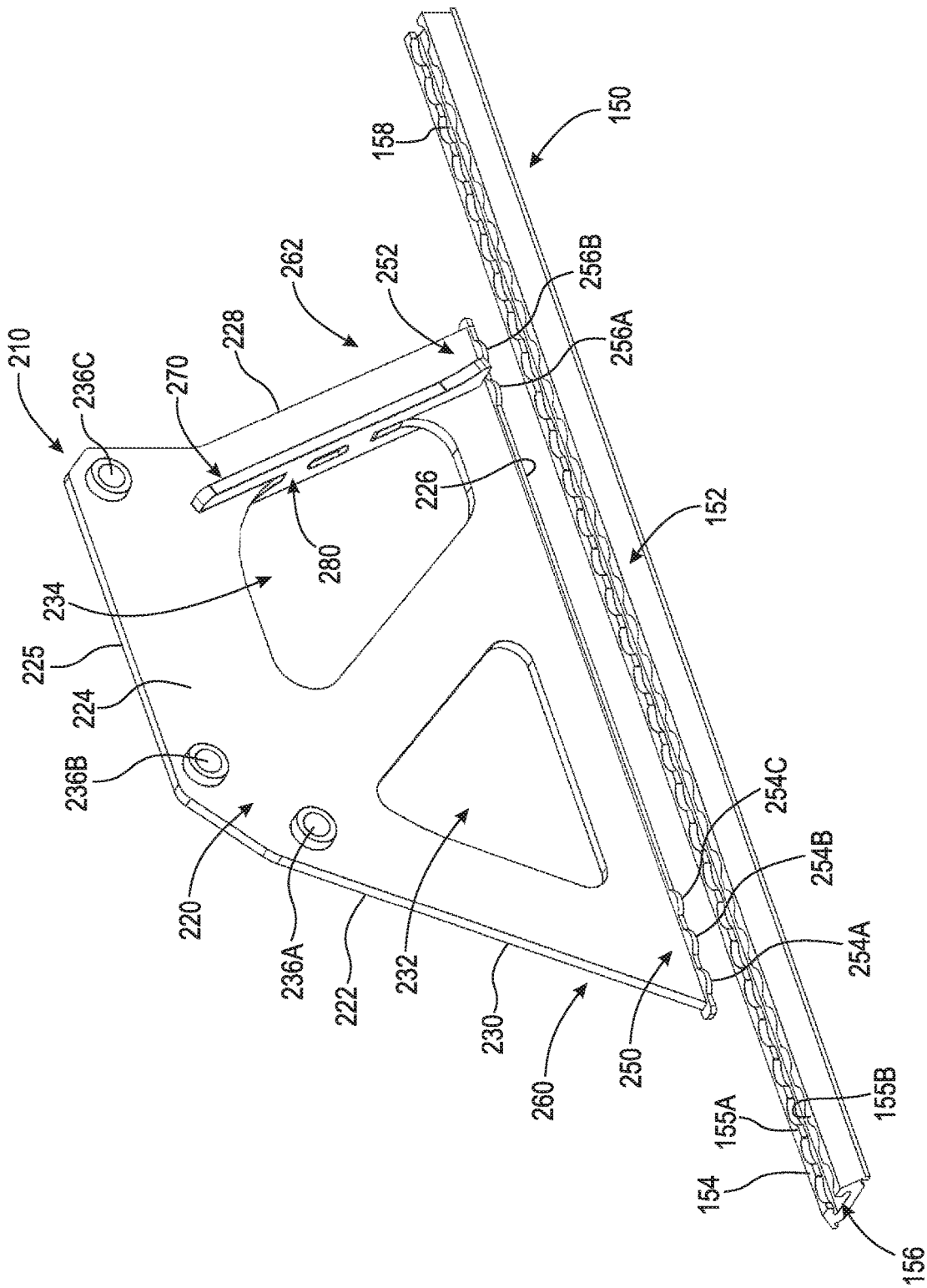


Fig. 6



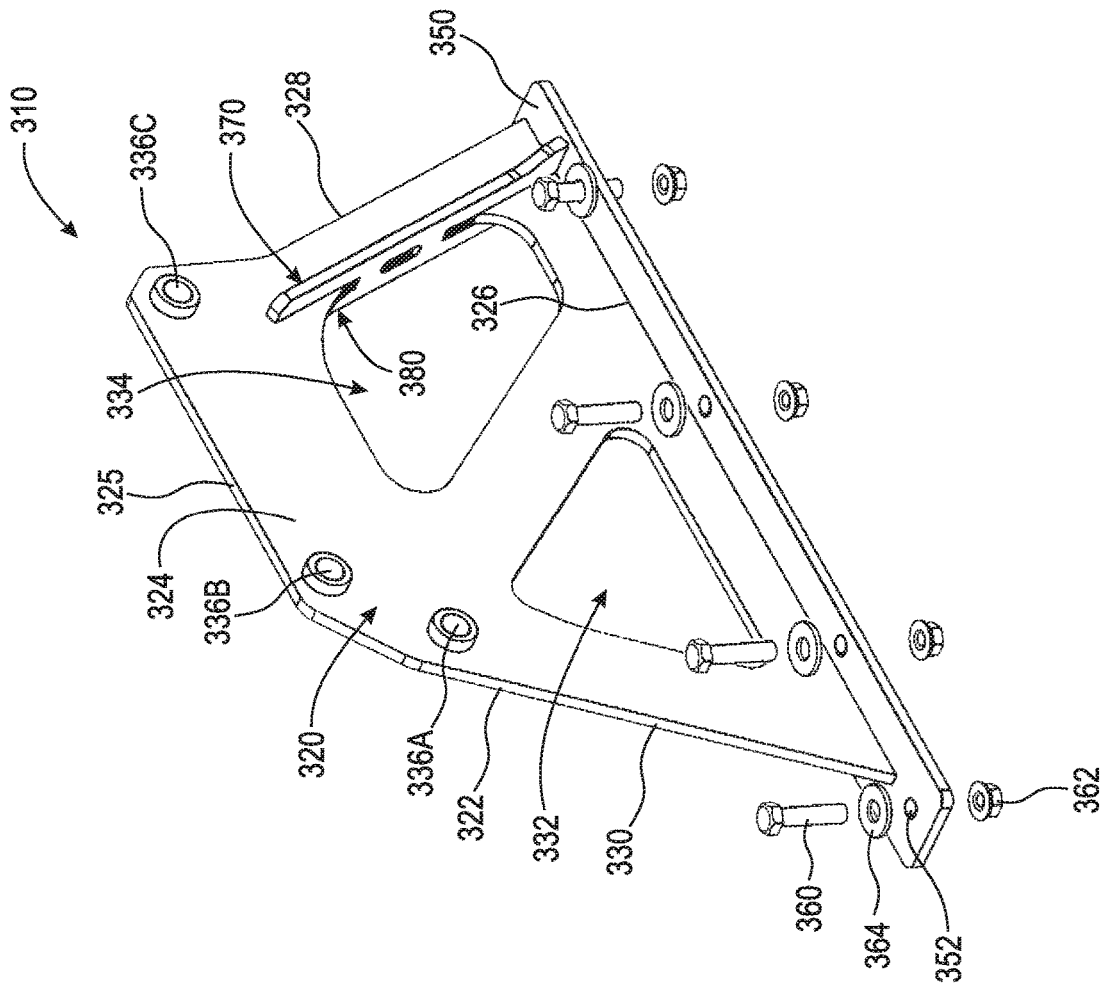


Fig. 7

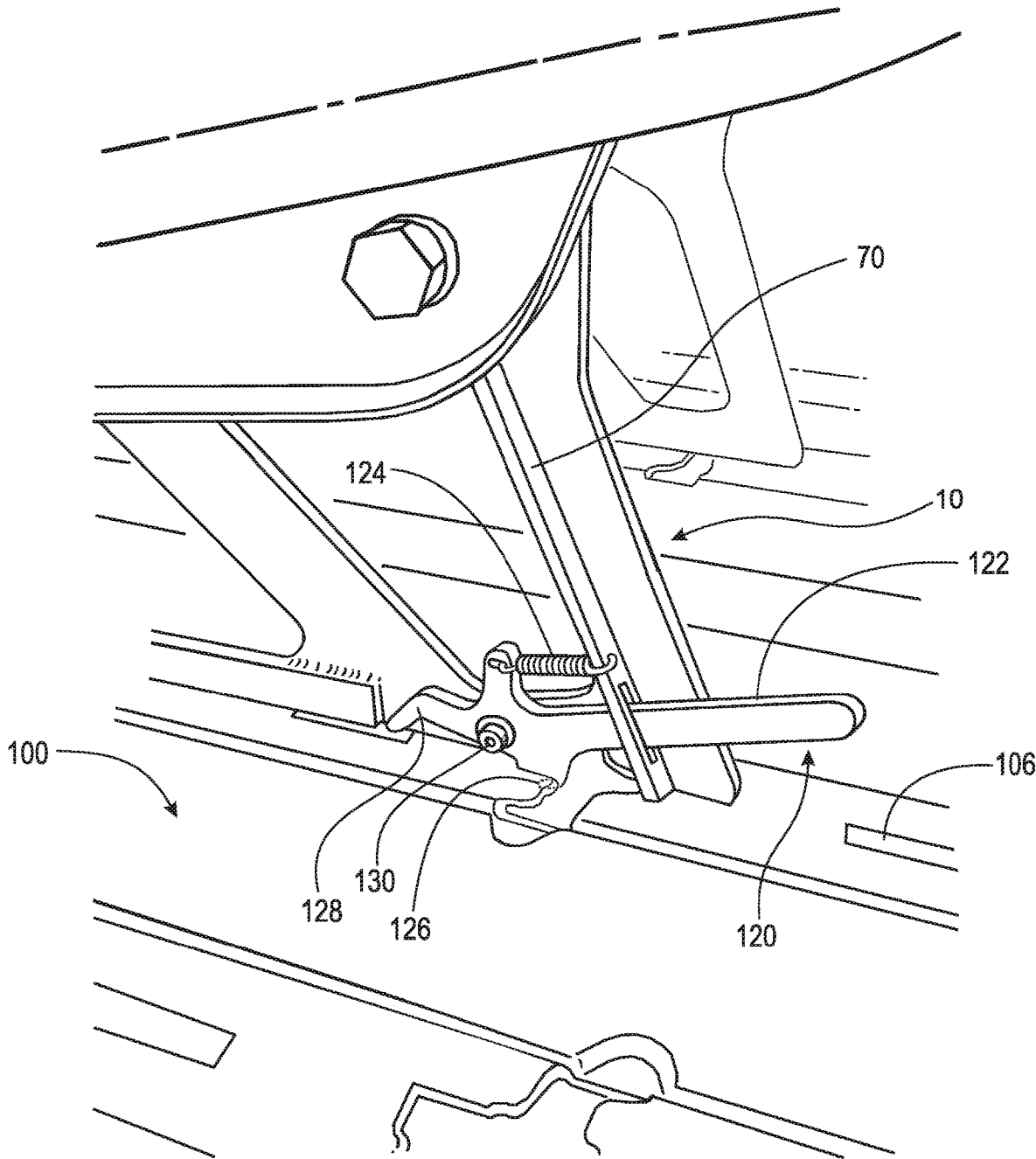


Fig. 8

1

**INTEGRABLE SEAT LEG****CROSS-REFERENCE TO RELATED APPLICATIONS**

This application claims the benefit under 35 U.S.C. § 119(e) of U.S. Provisional Application No. 62/568,577, filed Oct. 5, 2017, which application is incorporated herein by reference in its entirety.

**FIELD**

The present invention relates generally to floor-mounted tracks and seat adapters for positioning and locking original equipment manufacturer components within a transportation vehicle, and in particular, an integrable seat leg that allows original equipment manufacturer seats to be secured in various positions within the vehicle.

**BACKGROUND**

Cars, trucks, vans, airplanes, para-transit vehicles, buses, taxicabs, mobility cars, accessible sport-utility vehicles (SUV), and the like, have been adapted to include track systems that accommodate various types of equipment, cargo, and seating arrangements. Seating arrangements include standard one, two, or three passenger seating, transit seating, and wheelchair accessible seating. Track systems include horizontal A-tracks, vertical A-tracks, horizontal E-tracks, vertical E-tracks, F-tracks, and L-tracks. These tracks can be made of a variety of materials including iron and steel and can be all different lengths and widths. The track types (A, E, F, and L) are differently shaped and/or arranged to accommodate different fittings. A-tracks are traditionally used for cargo. L-tracks are traditionally used for tie downs and accessories such as oxygen tanks. Some seat adapters operate with L-tracks. The desired track system depends on the type of seating or equipment to be secured and the restraining mechanisms to be used with the seating or equipment.

The differences between the types of tracks can be subtle or blatant. Vertical A-tracks contain elongated rectangular apertures that are evenly distributed along the longitudinal axis of the track; each aperture is parallel to the sides of the track. Horizontal A-tracks contain elongated rectangular apertures that are also evenly dispersed along the longitudinal axis of the track; each aperture is arranged transversely to the sides of the track. E-tracks also contain generally elongated rectangular apertures disposed within the track, but E-tracks differ from A-tracks in cross section. In cross section, A-track apertures are in line with the track, whereas E-track apertures contain protrusions. F-tracks contain circular apertures in the track. The apertures in F-tracks, like the apertures in A-tracks, are in-line with the track. L-tracks contain a channel along the longitudinal axis of the track, a slot formed through the upper surface of the track in communication with the channel, and cylindrical apertures superimposed above the slot in the top surface of the track. In cross section, L-tracks are generally C-shaped. U.S. Pat. No. 7,975,979 (Bishop) discloses an L-track of this type. Similarly, U.S. Pat. No. 4,771,969 (Dowd) and U.S. Pat. No. 5,083,726 (Schurr) describe L-tracks.

Such track systems can be installed in the floor or along the walls of an array of vehicles to removably attach and secure cargo, standard passenger seats, transit seats, and/or wheelchairs. These track systems enable a vehicle owner and/or operator to set and vary the seating configuration of

2

a vehicle cabin. However, to install such track systems, the original equipment manufacturer (OEM) seats are removed and discarded in place of new seats that can be used with the new track system.

Therefore, there has been a long-felt need for an integral seat leg that can be secured to an OEM seat and used in any and all of the available track systems.

**SUMMARY**

According to aspects illustrated herein, there is provided an integrable seat leg for an original equipment manufacturer seat, comprising a vertical member, including a front end and a rear end, a first side surface and a second side surface, a top surface and a bottom surface, one or more engaging members extending from the bottom surface, and one or more through-bores arranged proximate the top surface to secure the integrable seat leg to the seat, wherein the one or more engaging members are operatively arranged to engage one or more respective apertures in track.

According to aspects illustrated herein, there is provided an integrable seat leg for an original equipment manufacturer seat, comprising a vertical member, including a front end and a rear end, a first side surface and a second side surface, a top surface and a bottom surface, one or more engaging members extending from the bottom surface and operatively arranged to engage one or more respective apertures in track, and one or more through-bores arranged proximate the top surface to secure the integrable seat leg to the seat, and at least one flange extending from one of the first side surface and the second side surface, and at least one protrusion extending from one of the first side surface and the second side surface.

According to aspects illustrated herein, there is provided a method for creating an integrable original equipment manufacturer seat, comprising removing an original equipment manufacturer seat from a vehicle, installing a track system on a floor of the vehicle, the track system including one or more frames having one or more apertures, securing an integrable seat leg to the original equipment manufacturer seat, the integrable seat leg including a front end and a rear end, a first side surface and a second side surface, a top surface and a bottom surface, one or more engaging members extending from the bottom surface and operatively arranged to engage the one or more apertures, and one or more through-bores arranged proximate the top surface to secure the integrable seat leg to the seat, and securing the integrable seat leg to the track system by engaging the one or more engaging members with the one or more apertures.

These and other objects, features, and advantages of the present disclosure will become readily apparent upon a review of the following detailed description of the disclosure, in view of the drawings and appended claims.

**BRIEF DESCRIPTION OF THE DRAWINGS**

Various embodiments are disclosed, by way of example only, with reference to the accompanying schematic drawings in which corresponding reference symbols indicate corresponding parts, in which:

FIG. 1 is a rear perspective view of an integrable seat leg;

FIG. 2A is front elevational view of the integrable seat leg shown in FIG. 1;

FIG. 2B is a rear elevational view of the integrable seat leg shown in FIG. 1;

FIG. 3 is a perspective view of the integrable seat leg shown in FIG. 1 secured to a seat;

FIG. 4 is a perspective view of the integrable seat leg shown in FIG. 1, secured to a seat and installed in a floor track;

FIG. 5 is a perspective exploded assembly view of an integrable seat leg shown in FIG. 1 ready for insertion into an X-track type floor track;

FIG. 6 is a perspective exploded assembly view of an integrable seat leg ready for insertion into an L-track type floor track;

FIG. 7 is a perspective exploded assembly view of an integrable seat leg ready for mounting to a vehicle floor; and,

FIG. 8 is a perspective assembly view of an integrable seat leg installed in a floor track and locked into place using a latch.

#### DETAILED DESCRIPTION

At the outset, it should be appreciated that like drawing numbers on different drawing views identify identical, or functionally similar, structural elements. It is to be understood that the claims are not limited to the disclosed aspects.

Furthermore, it is understood that this disclosure is not limited to the particular methodology, materials and modifications described and as such may, of course, vary. It is also understood that the terminology used herein is for the purpose of describing particular aspects only, and is not intended to limit the scope of the claims.

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood to one of ordinary skill in the art to which this disclosure pertains. It should be understood that any methods, devices or materials similar or equivalent to those described herein can be used in the practice or testing of the example embodiments. The assembly of the present disclosure could be driven by hydraulics, electronics, and/or pneumatics.

It should be appreciated that the term “substantially” is synonymous with terms such as “nearly,” “very nearly,” “about,” “approximately,” “around,” “bordering on,” “close to,” “essentially,” “in the neighborhood of,” “in the vicinity of,” etc., and such terms may be used interchangeably as appearing in the specification and claims. It should be appreciated that the term “proximate” is synonymous with terms such as “nearby,” “close,” “adjacent,” “neighboring,” “immediate,” “adjoining,” etc., and such terms may be used interchangeably as appearing in the specification and claims. The term “approximately” is intended to mean values within ten percent of the specified value.

Adverting now to the figures, FIG. 1 is a rear perspective view of integrable seat leg 10. FIG. 2A is front elevational view of integrable seat leg 10. FIG. 2B is a rear elevational view of integrable seat leg 10. The following description should be read in light of FIGS. 1, 2A, and 2B. Integrable seat leg 10 generally comprises vertical member 20. In an example embodiment, integrable seat leg 10 further comprises protrusion 50, protrusion 60, flange 70, and flange 80.

Vertical member 20 is generally a plate comprising surface 22, surface 24, top surface 25, bottom surface 26, front end 28, and rear end 30. Vertical member 20 is generally rectangular, however, may be any suitable shape (e.g., square-, triangular-, circular-, ovular-, or rhomboidal-shaped). Vertical member 20 may comprise one or more apertures, such as aperture 32 and aperture 34. Aperture 32 is generally triangular and extends from surface 22 to surface 24. Aperture 34 is generally ovular and extends from surface 22 to surface 24. It should be appreciated that apertures 32 and 34 may be any shape suitable for reducing

the weight of vertical member 20 without jeopardizing the strength thereof. Bottom surface 26 comprises a plurality of engaging members. In the embodiment shown, bottom surface 26 comprises engaging member 27A (see FIG. 2B), engaging member 27B (not shown), and engaging member 27C. Engaging member 27A is arranged proximate rear end 30, engaging member 27C is arranged proximate front end 28, and engaging member 27B (not shown) is arranged between engaging members 27A and 27C. Engaging members 27A-C are operatively arranged to engage apertures 106 in frames 102 and secure integrable seat leg 10 to track 100. Vertical member 20 further comprises through-bores 36A-C, which are operatively arranged thereon to secure integrable seat leg 10 to an original equipment manufacturer (OEM) vehicle seat or bench. In the embodiment shown, vertical member 20 includes three through-bores, however, any number of through-bores suitable for securing integrable seat leg to an OEM vehicle seat may be used. Vertical member 20 may further comprise holes 38A-C. Holes 38A-C are operatively arranged to secure spacer bars between multiple integrable seat legs. For example, for a single or a double OEM vehicle seat, two integrable seat legs may be needed. One or more spacer bars are secured at each end within the holes. These spacer bars ensure the engaging members of the integrable seat legs are properly spaced to engage the apertures of the track rails (see FIG. 4). In another example, for a double wide or triple wide OEM vehicle seat, three integrable seat legs may be needed. Thus, spacer bars might be included between each of the three integrable seat legs.

Protrusion 50 extends from surface 22. Protrusion 50 may be an integral part of vertical member 20 (i.e., formed together as a single component), or may be secured to vertical member 20 using any suitable means (e.g., welding, bolting, adhesives, etc.). Protrusion 50 comprises rear end 52, top surface 54, bottom surface 56, and front end 58. In the embodiment shown, rear end 52 is aligned with rear end 30 and bottom surface 56 is aligned with bottom surface 26. Bottom surface 56 includes engaging members 57A and 57B. In the embodiment shown, engaging members 57A and 57B are aligned with engaging members 27A and 27B, respectively. Engaging members 57A-B are operatively arranged to engage apertures 106 in frames 102 and secure integrable seat leg 10 to track 100 (see FIG. 4).

Protrusion 60 extends from surface 24. Protrusion 60 may be an integral part of vertical member 20 (i.e., formed together as a single component), or may be secured to vertical member 20 using any suitable means (e.g., welding, bolting, adhesives, etc.). Protrusion 60 comprises rear end 62, top surface 64, bottom surface 66 (not shown), and front end 68. In the embodiment shown, rear end 62 is aligned with rear end 30 and bottom surface 66 is aligned with bottom surface 26. Bottom surface 66 includes engaging members 67A and 67B (not shown). In the embodiment shown, engaging members 67A and 67B are aligned with engaging members 27A and 27B, respectively. Engaging members 67A-B are operatively arranged to engage apertures 106 in frames 102 and secure integrable seat leg 10 to track 100 (see FIG. 4).

Flange 70 extends from surface 22 proximate front end 28. Flange 70 may be an integral part of vertical member 20 (i.e., formed together as a single component), or may be secured to vertical member 20 using any suitable means (e.g., welding, bolting, adhesives, etc.). As shown, flange 70 is generally a rectangular prism, however, could be any shape suitable to add strength to integrable seat leg 10.

5

Flange **80** extends from surface **24** proximate front end **28**. Flange **80** may be an integral part of vertical member **20** (i.e., formed together as a single component), or may be secured to vertical member **20** using any suitable means (e.g., welding, bolting, adhesives, etc.). As shown, flange **80** is generally a rectangular prism, however, could be any shape suitable to add strength to integrable seat leg **10**.

In an example embodiment, a single plate is inserted into an aperture in vertical member **20** proximate end **28** to form flanges **70** and **80**. The plate is then welded in the aperture.

FIG. **3** is a perspective view of integrable seat leg **10** secured to OEM seat **1** (specifically two integrable seat legs). As shown, OEM seat **1** includes bracket **2** extending downward therefrom. OEM seat **1** may include a plurality of brackets. Integrable seat leg is positioned on a first side of bracket **2**. Vertical member **20** may abut against bracket **2** or one or more spacers or shims may be arranged there between to provide the correct spacing with respect to track **100** (see FIG. **4**). One or more bolts **6** are used to secure integrable seat leg **10** to bracket **2**. Bolts **6** are inserted through bracket **2** and respective holes **36A**, **36B**, and/or **36C** and secured with a nut. Any suitable fastening means may be used to secure integrable seat leg **10** to OEM seat **1** (e.g., welding, adhesives, rivets, etc.).

FIG. **4** is a perspective view of integrable seat leg **10** secured to OEM bench seat **110** and installed in floor track **100**. Floor track **100** generally comprises a plurality of frames **102**. Each of said plurality of frames **102** comprises top surface **104** and a plurality of apertures **106**. Integrable seat leg **10** is arranged with front end **28** directed toward the front end of the vehicle. Engaging members **27A-C**, and **57A-B/67A-B** if included on integrable seat leg **10**, are inserted into respective apertures **106**. Integrable seat leg **10** is then displaced in the direction of the front end of the vehicle, thereby locking engaging members **27A-C** about top surface **104**. The crux of this invention is to enable OEM seats and benches to be used A-tracks, vertical A-tracks, horizontal E-tracks, vertical E-tracks, F-tracks, L-tracks, or X-tracks. Using integrable seat leg **10**, OEM seats can be repositioned at various positions within the vehicle.

FIG. **5** is a perspective exploded assembly view of integrable seat leg **10** ready for insertion into X-track type floor track **140**. X-track type floor track **140** generally comprises a plurality of frames **142**. Each of said plurality of frames **142** comprises top surface **104**, a plurality of apertures **146**, and a plurality of X-shaped apertures **148**. Using engaging members **57A-C**, integrable seat leg **10** can be easily mounted to the vehicle floor at various locations thereon. Once engaged in X-track type floor track **140**, integrable seat leg **10** is locked in place using a latch or other suitable locking device.

FIG. **6** is a perspective exploded assembly view of integrable seat leg **210** ready for insertion into L-track type floor track **150**. Integrable seat leg **210** generally comprises vertical member **220**. In an example embodiment, integrable seat leg **210** further comprises engaging members **250**, **252**, **260**, and **262**, flange **270**, and flange **280**.

Vertical member **220** is generally a plate comprising surface **222**, surface **224**, top surface **225**, bottom surface **226**, front end **228**, and rear end **230**. Vertical member **220** is generally rectangular, however, may be any suitable shape (e.g., square-, triangular-, circular-, ovular-, or rhomboidal-shaped). Vertical member **220** may comprise one or more apertures, such as aperture **232** and aperture **234**. Aperture **232** is generally triangular and extends from surface **222** to surface **224**. Aperture **234** is generally ovular and extends from surface **222** to surface **224**. It should be appreciated

6

that apertures **232** and **234** may be any shape suitable for reducing the weight of vertical member **220** without jeopardizing the strength thereof. Bottom surface **226** comprises a plurality of protrusions. In the embodiment shown, bottom surface **226** comprises engaging member **250**, engaging member **252**, engaging member **260**, and engaging member **262**. Engaging members **250** and **260** are arranged proximate rear end **230**, and engaging members **252** and **260** are arranged proximate front end **228**. It should be appreciated that vertical member **220** may comprise any number of engaging members, for example, one or more engaging members, suitable for securing integrable seat leg **210** to L-track type floor track.

Engaging member **250** comprises a plurality of protrusions **254A-C** extending from surface **224**. Protrusions **254A-C** are generally hemispherical discs that extend perpendicularly from surface **224** to engage apertures **158** and channel **156** in L-track type floor track **150**. It should be appreciated that engaging member **250** may comprise any number of protrusions (e.g., one or more protrusions) suitable to secure integrable seat leg **210** to L-track type floor track **150**. Additionally, it should be appreciated that protrusions **254A-C** may comprise any geometric shape suitable for securing integrable seat leg **210** to L-track type floor track **150**, for example, triangular, ovular, rectangular, square, etc. Protrusions **254A-C** are aligned with apertures **158** of frame **152**. Protrusions **254A-C** are inserted through apertures **158** from top surface **154** such that they are arranged in channel **156**. Integrable seat leg **210** is then displaced axially along frame **152** such that flanges **155A-B** retain protrusions **254A-C** within channel **156**, thus locking integrable seat leg **210** to L-track type floor track **150**.

Engaging member **260** is substantially similar to, and aligned with, engaging member **250**. Engaging member **260** comprises a plurality of protrusions **264A-C** (not shown) extending from surface **222**. Protrusions **264A-C** (not shown) are generally hemispherical discs that extend perpendicularly from surface **222** to engage apertures **158** and channel **156** in L-track type floor track **150**. It should be appreciated that engaging member **260** may comprise any number of protrusions (e.g., one or more protrusions) suitable to secure integrable seat leg **210** to L-track type floor track **150**. Additionally, it should be appreciated that protrusions **264A-C** (not shown) may comprise any geometric shape suitable for securing integrable seat leg **210** to L-track type floor track **150**, for example, triangular, ovular, rectangular, square, etc. Protrusions **264A-C** (not shown) are aligned with apertures **158** of frame **152**. Protrusions **264A-C** (not shown) are inserted through apertures **158** from top surface **154** such that they are arranged in channel **156**. Integrable seat leg **210** is then displaced axially along frame **152** such that flanges **155A-B** retain protrusions **264A-C** (not shown) within channel **156**, thus locking integrable seat leg **210** to L-track type floor track **150**.

Engaging member **252** comprises a plurality of protrusions **256A-B** extending from surface **224**. Protrusions **256A-B** are generally hemispherical discs that extend perpendicularly from surface **224** to engage apertures **158** and channel **156** in L-track type floor track **150**. It should be appreciated that engaging member **252** may comprise any number of protrusions (e.g., one or more protrusions) suitable to secure integrable seat leg **210** to L-track type floor track **150**. Additionally, it should be appreciated that protrusions **256A-B** may comprise any geometric shape suitable for securing integrable seat leg **210** to L-track type floor track **150**, for example, triangular, ovular, rectangular, square, etc. Protrusions **256A-B** are aligned with apertures

158 of frame 152. Protrusions 256A-B are inserted through apertures 158 from top surface 154 such that they are arranged in channel 156. Integrable seat leg 210 is then displaced axially along frame 152 such that flanges 155A-B retain protrusions 256A-B within channel 156, thus locking integrable seat leg 210 to L-track type floor track 150.

Engaging member 262 is substantially similar to, and aligned with, engaging member 252. Engaging member 262 comprises a plurality of protrusions 266A-B (not shown) extending from surface 222. Protrusions 266A-B (not shown) are generally hemispherical discs that extend perpendicularly from surface 222 to engage apertures 158 and channel 156 in L-track type floor track 150. It should be appreciated that engaging member 262 may comprise any number of protrusions (e.g., one or more protrusions) suitable to secure integrable seat leg 210 to L-track type floor track 150. Additionally, it should be appreciated that protrusions 266A-B (not shown) may comprise any geometric shape suitable for securing integrable seat leg 210 to L-track type floor track 150, for example, triangular, ovalar, rectangular, square, etc. Protrusions 266A-B (not shown) are aligned with apertures 158 of frame 152. Protrusions 266A-C (not shown) are inserted through apertures 158 from top surface 154 such that they are arranged in channel 156. Integrable seat leg 210 is then displaced axially along frame 152 such that flanges 155A-B retain protrusions 266A-B (not shown) within channel 156, thus locking integrable seat leg 210 to L-track type floor track 150.

Using engaging members 250, 252, 260, and 262, integrable seat leg 210 can be easily mounted to the vehicle floor at various locations thereon. Once engaged in L-track type floor track 150, integrable seat leg 210 is locked in place using a latch or other suitable locking device.

Vertical member 220 further comprises through-bores 236A-C, which are operatively arranged thereon to secure integrable seat leg 210 to an original equipment manufacturer (OEM) vehicle seat or bench. In the embodiment shown, vertical member 220 includes three through-bores, however, any number of through-bores suitable for securing integrable seat leg to an OEM vehicle seat may be used. Vertical member 220 may further comprise holes operatively arranged to secure spacer bars between multiple integrable seat legs. For example, for a single or a double OEM vehicle seat, two integrable seat legs may be needed. One or more spacer bars are secured at each end within the holes. These spacer bars ensure the engaging members of the integrable seat legs are properly spaced to engage the apertures of the track rails (see FIG. 4). In another example, for a double wide or triple wide OEM vehicle seat, three integrable seat legs may be needed. Thus, spacer bars might be included between each of the three integrable seat legs.

Flange 270 extends from surface 222 proximate front end 228. Flange 270 may be an integral part of vertical member 220 (i.e., formed together as a single component), or may be secured to vertical member 220 using any suitable means (e.g., welding, bolting, adhesives, etc.). As shown, flange 270 is generally a rectangular prism, however, could be any shape suitable to add strength to integrable seat leg 210.

Flange 280 extends from surface 224 proximate front end 228. Flange 280 may be an integral part of vertical member 220 (i.e., formed together as a single component), or may be secured to vertical member 220 using any suitable means (e.g., welding, bolting, adhesives, etc.). As shown, flange 280 is generally a rectangular prism, however, could be any shape suitable to add strength to integrable seat leg 210.

In an example embodiment, a single plate is inserted into an aperture in vertical member 220 proximate end 228 to form flanges 270 and 280. The plate is then welded in the aperture.

FIG. 7 is a perspective exploded assembly view of integrable seat leg 310 ready for mounting to a vehicle floor using a plurality of fasteners (e.g., bolts, rivets, screws, nails, etc.). Integrable seat leg 310 generally comprises vertical member 320. In an example embodiment, integrable seat leg 310 further comprises flange 350, flange 370, and flange 380.

Vertical member 320 is generally a plate comprising surface 322, surface 324, top surface 325, bottom surface 326, front end 328, and rear end 330. Vertical member 320 is generally rectangular, however, may be any suitable shape (e.g., square-, triangular-, circular-, ovalar-, or rhomboidal-shaped). Vertical member 320 may comprise one or more apertures, such as aperture 332 and aperture 334. Aperture 332 is generally triangular and extends from surface 322 to surface 324. Aperture 334 is generally ovalar and extends from surface 322 to surface 324. It should be appreciated that apertures 332 and 334 may be any shape suitable for reducing the weight of vertical member 320 without jeopardizing the strength thereof. Bottom surface 326 comprises a plurality of protrusions. In the embodiment shown, bottom surface 326 is connected to flange 350. Flange 350 comprises a plurality of through-bores 352. The plurality of fasteners are arranged to be inserted through the plurality of through-bores and a plurality of corresponding holes in the vehicle floor and be fastened thereto. In an example embodiment bolts 360, nuts 362, and washers 364 are used to secure flange 350 to the vehicle floor thus securing integrable seat leg 310. Flange 350 is generally rectangular; however it should be appreciated that flange 350 may be any shape suitable for securing integrable seat leg 310 to the vehicle floor, such as triangular, square, ovalar, etc. Additionally, it should be appreciated that flange 350 does not have to be one continuous flange, but rather may be a plurality of smaller flanges having one or more through-bores.

Vertical member 320 further comprises through-bores 336A-C, which are operatively arranged thereon to secure integrable seat leg 310 to an original equipment manufacturer (OEM) vehicle seat or bench. In the embodiment shown, vertical member 320 includes three through-bores, however, any number of through-bores suitable for securing integrable seat leg to an OEM vehicle seat may be used. Vertical member 320 may further comprise holes operatively arranged to secure spacer bars between multiple integrable seat legs. For example, for a single or a double OEM vehicle seat, two integrable seat legs may be needed.

One or more spacer bars are secured at each end within the holes. These spacer bars ensure the engaging members of the integrable seat legs are properly spaced to engage the apertures of the track rails (see FIG. 4). In another example, for a double wide or triple wide OEM vehicle seat, three integrable seat legs may be needed. Thus, spacer bars might be included between each of the three integrable seat legs.

Flange 370 extends from surface 322 proximate front end 328. Flange 370 may be an integral part of vertical member 320 (i.e., formed together as a single component), or may be secured to vertical member 320 using any suitable means (e.g., welding, bolting, adhesives, etc.). As shown, flange 370 is generally a rectangular prism, however, could be any shape suitable to add strength to integrable seat leg 310.

Flange 380 extends from surface 324 proximate front end 328. Flange 380 may be an integral part of vertical member 320 (i.e., formed together as a single component), or may be

secured to vertical member 320 using any suitable means (e.g., welding, bolting, adhesives, etc.). As shown, flange 380 is generally a rectangular prism, however, could be any shape suitable to add strength to integrable seat leg 310.

In an example embodiment, a single plate is inserted into an aperture in vertical member 320 proximate end 328 to form flanges 370 and 380. The plate is then welded in the aperture.

FIG. 8 is a perspective assembly view of integrable seat leg 10 installed in floor track 100 and locked into place using latch 120. Latch 120 comprises bar 122, spring 124, hook 126, and hook 128. Latch 120 is secured to integrable seat leg 10 via bolt 130. Bolt 130 may be any suitable fastener. Spring 124 connects latch 120 to flange 70. Bar 122 may extend through an aperture in flange 70. Hook 126 is arranged to engage apertures 106 and lock integrable seat leg 10 within floor track 100 (i.e., prevents integrable seat leg 10 from displacing toward the back of the vehicle, and maintains engaging members engagement with apertures 106).

It will be appreciated that various aspects of the disclosure above and other features and functions, or alternatives thereof, may be desirably combined into many other different systems or applications. Various presently unforeseen or unanticipated alternatives, modifications, variations, or improvements therein may be subsequently made by those skilled in the art which are also intended to be encompassed by the following claims.

REFERENCE NUMERALS

- 1 Original equipment manufacturer (OEM) seat
- 2 Bracket
- 6 Bolts
- 10 Integrable seat leg
- 20 Vertical member
- 22 Surface
- 24 Surface
- 25 Top surface
- 26 Bottom surface
- 27A Engaging member
- 27B Engaging member
- 27C Engaging member
- 28 Front end
- 30 Rear end
- 32 Aperture
- 34 Aperture
- 36A Through-bore
- 36B Through-bore
- 36C Through-bore
- 38A Hole
- 38B Hole
- 38C Hole
- 50 Protrusion
- 52 Rear end
- 54 Top surface
- 56 Bottom surface
- 57A Engaging member
- 57B Engaging member
- 58 Front end
- 60 Protrusion
- 62 Rear end
- 64 Top surface
- 66 Bottom surface
- 67A Engaging member
- 67B Engaging member
- 68 Front end

- 70 Flange
- 80 Flange
- 100 Floor track
- 102 Frames
- 5 104 Top surface
- 106 Apertures
- 110 Original equipment manufacturer (OEM) bench seat
- 120 Latch
- 122 Bar
- 10 124 Spring
- 126 Hook
- 128 Hook
- 130 Bolt
- 140 X-track type floor track
- 15 142 Frames
- 144 Top surface
- 146 Apertures
- 148 X-shaped apertures
- 150 L-track type floor track
- 20 152 Frame
- 154 Top surface
- 155A Flange
- 155B Flange
- 156 Channel
- 25 210 Integrable seat leg
- 220 Vertical member
- 222 Surface
- 224 Surface
- 225 Top surface
- 30 226 Bottom surface
- 228 Front end
- 230 Rear end
- 232 Aperture
- 234 Aperture
- 35 236A Through-bore
- 236B Through-bore
- 236C Through-bore
- 250 Engaging member
- 252 Engaging member
- 40 254A Protrusion
- 254B Protrusion
- 254C Protrusion
- 256A Protrusion
- 256B Protrusion
- 45 260 Engaging member
- 262 Engaging member
- 264A Protrusion (not shown)
- 264B Protrusion (not shown)
- 264C Protrusion (not shown)
- 50 266A Protrusion (not shown)
- 266B Protrusion (not shown)
- 270 Flange
- 280 Flange
- 310 Integrable seat leg
- 55 320 Vertical member
- 322 Surface
- 324 Surface
- 325 Top surface
- 326 Bottom surface
- 60 328 Front end
- 330 Rear end
- 332 Aperture
- 334 Aperture
- 336A Through-bore
- 65 336B Through-bore
- 336C Through-bore
- 350 Flange

- 352 Through-bores
- 360 Bolts
- 362 Nuts
- 364 Washers
- 370 Flange
- 380 Flange

What is claimed is:

1. An integrable seat leg for an original equipment manufacturer seat, comprising:

- a vertical member operatively arranged to be secured to the seat, the vertical member including:
  - a front end and a rear end;
  - a first side surface and a second side surface;
  - a top surface and a bottom surface;
  - one or more engaging members extending from the bottom surface; and,
  - at least one protrusion extending from one of the first side surface and the second side surface;
- wherein the one or more engaging members are operatively arranged to engage one or more respective apertures in track.

2. The integrable seat leg as recited in claim 1, further comprising at least one flange extending from one of the first side surface and the second side surface.

3. The integrable seat leg as recited in claim 2, wherein the at least one flange is arranged proximate the front end.

4. The integrable seat leg as recited in claim 1, further comprising a first flange extending from the first side surface and a second flange extending from the second side surface, wherein the first flange and the second flange are arranged proximate the front end.

5. The integrable seat leg as recited in claim 1, further comprising one or more through-bores arranged proximate the top surface to secure the integrable seat leg to the seat.

6. The integrable seat leg as recited in claim 1, wherein the at least one protrusion is arranged proximate the rear end.

7. The integrable seat leg as recited in claim 1, further comprising a first protrusion extending from the first side surface and a second protrusion extending from the second side surface, wherein the first protrusion and the second protrusion are arranged proximate the rear end.

8. The integrable seat leg as recited in claim 1, wherein the vertical member further comprises one or more apertures.

9. The integrable seat leg as recited in claim 1, wherein the one or more engaging members comprise one or more hemispherical discs.

10. The integrable seat leg as recited in claim 9, wherein the one or more hemispherical discs are arranged perpendicular to the first side surface.

11. The integrable seat leg as recited in claim 1, further comprising a locking latch.

12. An integrable seat leg for an original equipment manufacturer seat, comprising:

- a vertical member, including:
  - a front end and a rear end;
  - a first side surface and a second side surface;
  - a top surface and a bottom surface;
  - one or more engaging members extending from the bottom surface and operatively arranged to engage one or more respective apertures in track; and,

one or more through-bores arranged proximate the top surface to secure the integrable seat leg to the seat; and,

at least one flange extending from one of the first side surface and the second side surface; and,

at least one protrusion extending from one of the first side surface and the second side surface.

13. The integrable seat leg as recited in claim 12, further comprising a first flange extending from the first side surface and a second flange extending from the second side surface, wherein the first flange and the second flange are arranged proximate the front end.

14. The integrable seat leg as recited in claim 12, further comprising a first protrusion extending from the first side surface and a second protrusion extending from the second side surface, wherein the first protrusion and the second protrusion are arranged proximate the rear end.

15. The integrable seat leg as recited in claim 12, wherein the vertical member further comprises one or more apertures.

16. The integrable seat leg as recited in claim 12, wherein the one or more engaging members are hook-shaped.

17. The integrable seat leg as recited in claim 12, wherein the vertical member further comprises one or more holes arranged for one or more spacer rods.

18. A method for creating an integrable original equipment manufacturer seat, comprising:

- removing an original equipment manufacturer seat from a vehicle;
- installing a track system on a floor of the vehicle, the track system including one or more frames having one or more apertures;

securing an integrable seat leg to the original equipment manufacturer seat, the integrable seat leg including:

- a front end and a rear end;
- a first side surface and a second side surface;
- a top surface and a bottom surface;
- one or more engaging members extending from the bottom surface and operatively arranged to engage the one or more apertures; and,
- one or more through-bores arranged proximate the top surface to secure the integrable seat leg to the seat; and,

securing the integrable seat leg to the track system by engaging the one or more engaging members with the one or more apertures.

19. The method as recited in claim 18, wherein the step of securing the integrable seat leg to the track system comprises:

- inserting the one or more engaging members into the one or more apertures; and,
- displacing the integrable seat leg in a first direction.

20. The method as recited in claim 18, wherein the step of securing the integrable seat leg to the original equipment manufacturer seat comprises:

- aligning the one or more through-bores with respective holes in a bracket of the seat; and,
- fastening the integrable seat leg to the bracket via one or more bolts.

\* \* \* \* \*