



(11) **EP 3 131 440 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention
of the grant of the patent:
02.01.2019 Bulletin 2019/01

(21) Application number: **15722606.9**

(22) Date of filing: **16.04.2015**

(51) Int Cl.:
A47F 11/10 ^(2006.01)

(86) International application number:
PCT/US2015/026208

(87) International publication number:
WO 2015/161100 (22.10.2015 Gazette 2015/42)

(54) **MERCHANDISE DISPLAY**
WARENVERKAUFSTÄNDER
PRÉSENTOIR DE MARCHANDISES

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

(30) Priority: **16.04.2014 US 201414254873**

(43) Date of publication of application:
22.02.2017 Bulletin 2017/08

(73) Proprietor: **RTC Industries, Inc.**
Rolling Meadows, IL 60008 (US)

(72) Inventors:
• **NICIEJA, Robert**
Carol Stream, Illinois 60188 (US)

• **HUBLEY, Thomas E.**
Fox River Grove, Illinois 60021 (US)

(74) Representative: **Bryers LLP**
7 Gay Street
Bath, Bath and North East Somerset BA1 2PH
(GB)

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Description

FIELD OF THE INVENTION

[0001] The present invention relates generally to a merchandise display with a merchandise display system comprising a power connector assembly.

BACKGROUND OF THE INVENTION

[0002] In many exemplary power/signal systems, there is a problem with providing power to many devices while trying to create good wire management. Additionally, there is a problem with providing power to many devices while creating a dynamic or flexible system that allows for device relocation, addition of devices, and removal of devices for the power/signal systems. Existing solutions provide cable raceways with multiple connection points (outlet strip approach) or power track systems (track lighting approach). Although many conductors for power and signal combinations can be used, the "outlet strip approach" lacks flexibility and expandability for adding or relocating devices. Traditional powered track systems lack easy ways to incorporate many power and signal conductors. Additionally, for each conductor added to the traditional power track systems the connector required to access those conductors grows significantly in complexity and size.

[0003] Korean (South) Patent Publication No. 2007/016297 A discloses a lighting system for a display rack in which a multi-terminal power supply provides alternating positive and negative terminals at discrete locations along a vertical support frame of the display rack and a connector of an LED lighting device is provided with a pair of positive and negative terminals to electrically connect the LED lighting device to the power supply.

[0004] German Utility Model Publication No. DE 20 2012 008 355 U1 discloses a suspension device for presenting goods, comprising a profiled rail (1) and a primary support (94). An electrical profiled element (2), through which electrical conductors (24) on an insulating base (20) extend, is inserted into the profiled rail (1), and the electrical conductors (24) are accessible via a passage (10) of the profiled rail (1). The primary support (4) can be hung in the profiled rail (1) and has an insertion section (41) that can be inserted into the passage (10). An adapter (5,6), from which an electrical supply line (79) extends, is arranged on the primary support (4) and has current collectors (54, 64) having resilient contacts (541,641), which are intended to tap current on the electrical conductors (24).

[0005] According to an object of the present invention, a low voltage power system may include a configuration of ferrous material, conductive material, and nonconductive materials arranged in such a way as to provide a method for power and/or signal distribution to a mating device, such as to a set of magnetic LED modules or other similar low voltage power devices. Generally, low

voltage power systems and low voltage power devices have a voltage of approximately 24 volts or less.

[0006] According to another object of the present invention, a power system may include a configuration of conductive material and mechanical connections arranged in such a way as to provide a method for power and/or signal distribution to a mating device, such as to a set of mechanically-connected low voltage power devices.

SUMMARY OF THE INVENTION

[0007] The scope of the present invention is limited by the scope of the appended claims.

[0008] The present invention provides a merchandise display as claimed in claim 1.

[0009] The merchandise display system may include: a track that includes one or more conductive rods adjacent to one another, wherein the track is powered from a power source and the track is configured to connect to the merchandise display system; a tray assembly configured to display products and connect to the merchandise display system. The tray assembly may include: a power connector that connects to the track both through a mechanical connection and a power connection, wherein the power connector includes a contact, a wire harness, a power jack; and a printed circuit board that connects to the power jack of the power connector. The printed circuit board may be configured to provide power to a power device. The low voltage power device may be a LED lighting system configured to illuminate the merchandise display system.

[0010] Other objects and features of the present invention, the scope of which is limited by the scope of the appended claims, will become apparent by reference to the following description and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0011] A more complete understanding of the present invention and certain advantages thereof may be acquired by referring to the following detailed description in consideration with the accompanying drawings, in which:

Figure 1 shows a perspective view of an example lighting assembly not according to the invention that includes a track and connector assembly.

Figure 2 shows an exploded perspective view of the track and connector assembly of **Figure 1**.

Figure 3 shows an exploded perspective view of a power connector assembly of the track and connector assembly illustrated in **Figure 1**.

Figure 4 shows a perspective view of another example lighting assembly not according to the invention that includes a track and connector assembly.

Figure 5 shows a cross-section view of the track and connector assembly of **Figure 4**.

Figure 6 shows a perspective view of a track of the track and connector assembly illustrated in **Figure 4**.

Figure 7 illustrates a perspective view of a power connector assembly of the track and connector assembly illustrated in **Figure 4**.

Figure 8 illustrates a perspective view of an example power assembly not according to the invention that includes a track and connector assembly.

Figure 9A illustrates a close-up perspective view of the power connector assembly of the track and connector assembly illustrated in **Figure 8**.

Figure 9B illustrates a cross-section perspective view of the power connector assembly of the track and connector assembly illustrated in **Figure 8**.

Figure 9C illustrates a cross-section view of the power connector assembly of the track and connector assembly illustrated in **Figure 8**.

Figure 10 illustrates a perspective view of an exemplary low power voltage system used with a merchandise display, according to the present invention.

Figures 11A and 11B illustrate views of a track for the low power voltage system illustrated in **Figure 10**.

Figures 12A and 12B illustrate close-up views of the track of **Figures 11A and 11B** for the low power voltage system illustrated in **Figure 10**.

Figure 13 illustrates an exploded view of the low power voltage system illustrated in **Figure 10**.

Figure 14 illustrates a perspective view of a tray assembly for the low power voltage system illustrated in **Figure 10**.

Figures 15A and 15B illustrate perspective views of the power contact assembly for the low power voltage system illustrated in **Figure 10**.

Figures 16A and 16B illustrate views of the LED printed circuit board assembly for the low power voltage system illustrated in **Figure 10**.

[0012] The reader is advised that the attached drawings are not necessarily drawn to scale.

DETAILED DESCRIPTION

[0013] In the following description of various example structures in accordance with the present invention, reference is made to the accompanying drawings, which form a part hereof, and in which are shown by way of illustration of various structures in accordance with the present invention. Additionally, it is to be understood that other specific arrangements of parts and structures may be utilized, and structural and functional modifications may be made without departing from the scope of the present invention as defined by the scope of the appended claims. Also, while the terms "top" and "bottom" and the like may be used in this specification to describe various example features and elements of the present invention, these terms are used herein as a matter of convenience, e.g., based on the example orientations shown

in the Figures and/or the orientations in typical use. Nothing in this specification should be construed as requiring a specific three dimensional or spatial orientation of structures in order to fall within the scope of the present invention as defined by the scope of the appended claims.

[0014] Uses for the present invention include but are not limited to retail environments that may require periodic/regular relocation of devices connected to the distribution track. These merchandise displays are intended to distribute both power while allowing the easy movement and placement of connected devices such as lighting systems for the retail merchandise display systems.

[0015] An example low voltage power system is illustrated in **Figures 1 to 7**. Generally, the low voltage power system may be utilized as a distribution track with a magnetic power connector connected both magnetically and for power to the distribution track. In one example, a lighting assembly or lighting bar with one or more magnetic connector lighting systems, such as LEDs or other types of lights. The example low power voltage system may include a configuration or assembly of ferrous material, conductive material, and nonconductive materials arranged in such a way as to provide a method for power and/or signal distribution to a mating device. The mating device may include a set of magnetic LED modules. The mating device may include magnetic materials, such as magnets or magnetic coils, conductive materials, nonconductive materials, and electronics. The conductive materials may be for example spring contacts. The electronics may utilize the distributed power and/or signals.

[0016] As illustrated in an example in **Figures 1 to 3**, an example low power voltage system 200 is shown. In this example, the low voltage power system 200 is an example lighting system. Those of skill in the art will recognize that any low voltage power system may be utilized without departing from this disclosure. The example lighting system 200 may also be a track and connector assembly 200 for use with a retail merchandise display system. The track and connector assembly 200 may include a track 210 and a power connector assembly 250. **Figure 1** illustrates a perspective view of the track and connector assembly 200. **Figure 2** illustrates an exploded perspective view of the track and connector assembly 200 to include both the track 210 and the power connector assembly 250. **Figure 3** illustrates an exploded perspective view of the power connector assembly 250. Generally, the power connector assembly 250 connects to the track 210 both through a magnetic connection and a power connection. The power connector assembly 250 may connect to the track 210 on any part of the track 210.

[0017] The track 210 may include a first end assembly 212 and a second end assembly 214. The first end assembly 212 may be non-powered. The second end assembly 214 may include a powered top portion 216, a powered bottom portion 218, and one or more track power contacts 220. Generally, the powered portion (both top 216 and bottom 218) may provide a power source to the track 210 through the one or more track power con-

tacts 220. The track 210 may include one or more bus bars 224 for the power connection and a metal plate 226 for the magnetic connection. The bus bars 224 may be conductive plates or other surfaces and materials that allow the distribution of power. The metal plate 226 may be any ferrous plate or other surfaces and materials for magnetic connections. Those of skill in the art will recognize that any material, shape, form, or type of conductive material may be utilized for the bus bars 224. Additionally, those of skill in the art will recognize that any material, shape, form, or type of ferrous material may be utilized for the metal plates 226, such as brass. The track 210 may also include a track mounting bracket 222. The track mounting bracket 222 may be utilized to mount to the merchandise display system, thereby allowing the track and connector assembly 200 to attach to the merchandise display system at any preferred location. Those of skill in the art will recognize that the merchandise display system may include multiple tracks 210 and multiple power connector assemblies 250 without departing from this disclosure.

[0018] The power connector 250 may include a housing which may include a first or left housing 252 and a second or right housing 254. Within the left housing 252 and the right housing 254 may include one or more power connector contacts 256. The power connector contacts 256 may be configured and located in line with the powered bus bars 224 on the track 210. One or more power connector jacks 258 may be electronically connected to the power connector contacts 256. The power connector jacks 258 may then provide power to a low voltage power device. The low voltage power device may include various lighting systems, such as individual LEDs or other such similar low voltage power assemblies for the merchandise display system.

[0019] Additionally, the power connector 250 may include a magnetic source 260 or mating device. The magnetic source may be a magnetic coil, magnet, or induction coil. Other magnetic or mating devices may be utilized without departing from this disclosure. The magnetic source 260 may be configured and located in line with the metal plate 226 on the track 210. The magnetic source 260 allows the power connector 250 and any low voltage power supply assemblies connected to the power connector 250 the ability to be moved along the entire length of the track 210. For example, individual LEDs may be utilized and moved along the entire length of the track 210.

[0020] As illustrated in another example in **Figures 4 to 7**, another example low voltage power supply system 300 is shown. In this example, a lighting system 300 is utilized as the low voltage power supply system, however other low voltage power supply systems may be utilized without departing from this disclosure. For example, the exemplary lighting system 300 may also be a track and connector assembly 300 for use with a retail merchandise display system.

[0021] The track and connector assembly 300 may in-

clude a track 310 and a power connector 350. **Figure 4** illustrates a perspective view of the track and connector assembly 300. **Figure 5** illustrates a cross-section view of the track and connector assembly 300 to include both the track 310 and the power connector assembly 350. **Figure 6** illustrates a perspective view of the track 310. **Figure 7** illustrates a perspective view of the power connector assembly 350. Generally, the power connector assembly 350 connects to the track 310 both through a magnetic connection and a power connection. The power connector assembly 350 may connect to the track 310 along any portion of the track 310.

[0022] The track 310 may include one or more conductive plates 324 and one or more ferrous plates 326. As illustrated in **Figure 12**, a plurality of insulative materials 328 may be located between each of the ferrous plates 326 and the conductive plates 324. Those of skill in the art will recognize that any material, shape, form, or type of ferrous material may be utilized for the ferrous plates 324. Additionally, those of skill in the art will recognize that any material, shape, form, or type of conductive material may be utilized for the conductive plates 326, such as brass. The track 310 may also include a track mounting bracket (not shown). The track mounting bracket may mount to the merchandise display system, thereby allowing the track and connector assembly 300 to attach to the merchandise display system at any preferred location. In another aspect, the track may be a freestanding track without the need for a track mounting bracket. Those of skill in the art will recognize that a merchandise display system may include multiple tracks 310 and multiple power connector assemblies 350 and low voltage power supply systems without departing from this disclosure.

[0023] As illustrated in **Figures 4, 5, and 6**, the power connector 350 may include a printed circuit board 352 which houses the electronics for the power connector 350. In this example, a lighting assembly 354 that includes one or more LEDs 355 and/or other light sources known and used in the art may be electronically connected to the printed circuit board 352. Other low voltage power supply devices may be utilized and electronically connected to the printed circuit board 352 without departing from this disclosure. Additionally, the power connector 350 may include one or more power connector contacts 356. The power connector contacts 356 may be configured and located in line with the conductive plates 324 on the track 310. The power connector contacts 356 may be defined by spring contacts or any other type of power contacts known and used in the art. The power contacts 356 may then provide power to the lighting assembly 354, such as individual LEDs or other such similar lighting assemblies for the merchandise display system.

[0024] Additionally, the power connector 350 may include a magnetic source 260 or mating device. The magnetic source may be a magnetic coil, magnet, or induction coil. Other magnetic or mating devices may be utilized without departing from this disclosure. The magnetic

source 360 may be configured and located in line with the ferrous plates 326 on the track 310. The magnetic source 360 allows the power connector 350 and any lighting assemblies 354 (or low voltage power connectors) to be connected to the power connector 350 with the ability to be moved along the entire length of the track 310.

[0025] The examples illustrated in **Figures 1 to 7** solve the problem with providing power to many devices while trying to create good wire management, and also creating a dynamic or flexible system that allows for device relocation, addition of devices, and removal of devices for the power/signal system. Existing solutions include cable raceways with multiple connection points (outlet strip approach) or powered track systems (track lighting approach). However, these traditional approaches fall short in several ways. Although many conductors for power and signal combinations can be used, the "outlet strip approach" lacks flexibility and expandability for adding or relocating devices. Traditional powered track systems lack easy ways to incorporate many power and signal conductors. Additionally, for each conductor added to the traditional power track systems the connector required to access those conductors grows significantly in complexity and size.

[0026] The purpose of the examples illustrated in **Figures 1 to 7** is to provide a "break away" connection. Another purpose of the examples illustrated in **Figures 1 to 7** is to provide an easy to use power and signal distribution track system. Track lighting is a good example of a powered track system intended for distributing power to many devices, however current track lighting systems do not use magnetic attachment methods and are not intended for distributing more than power for connected devices. These examples are intended to distribute both power while allowing the easy movement and placement of connected devices such as lighting systems for the retail merchandise display systems.

[0027] Examples of retail uses for this example are under-shelf or display-case lighting that may require spot lights for product specials. Spot light modules such as the proof of concept prototype could be used to add lighting in a dynamic, modular, and reconfigurable way. Examples of non-retail applications might include systems which use sensor modules that communicate via additional conductors in the configuration or assembly. This type of application would allow for easy customization of the sensor system.

[0028] If additional voltages are added to the configuration of products, additional configurations of products that require different voltages could be connected on the same distribution track such that the devices contacts make contact only with the conductors required. In an example, there may be two bus bars and/or conductive plates. In another example, there may be four bus bars and/or conductive plates in order to handle various additional voltages.

[0029] Other devices using this distribution track may separate the magnetic connector from the device itself

by using a corded magnetic connector. This allows for many types of devices (especially larger devices) to make use of the distribution track. One example might be embedded hardware devices which use the distribution track as a means for getting power and for intercommunications between embedded devices utilizing additional signal conductors.

[0030] Another advantage of this example is that the distribution track implementations may incorporate many conductors for power and/or signal and may only grow in size as conductors are added. The additional conductors for power and/or signal may not increase the complexity because the access of one conductor does not interfere with the other conductors as it does in the traditional powered track approach. This characteristic allows the design technique to be scalable for many applications.

[0031] LED lighting systems may be utilized with these examples as a low voltage power supply with magnetic connections, and specifically LED lighting systems utilized with a retail merchandise display system. LED lighting systems are disclosed in U.S. Application Serial No. 13/162,076, filed June 16, 2011 and U.S. Application Serial No. 12/955,198, filed November 29, 2010 (granted as U.S. Patent No. 8,864,334).

[0032] As illustrated in **Figures 8 to 9C**, a power assembly may utilize a mechanical connection instead of the magnetic connection as described above. The power assembly may be a low voltage power assembly. Additionally, high voltage power assemblies may utilize the mechanical connections disclosed without departing from this disclosure. The mechanical connection may be a snap connector or other kinds of mechanical connections known and used in the art. As was described above, the power assembly may comprise a track that includes one or more conductive plates and a mechanical connector, wherein the track is powered from a power source; and a power connector assembly that connects to the track, wherein the one or more conductive plates connect to the power assembly providing a power connection, and further wherein the mechanical connector connects to the power assembly providing a secure connection. This power connector assembly may be configured to provide power through the track to a power device.

[0033] Generally, below, a low voltage power system will be described. The low voltage power system may be utilized as a distribution track with a mechanical power connector connected both mechanically and for power to the distribution track. The example low power voltage system may include a configuration or assembly of conductive materials arranged in such a way as to provide a method for power and/or signal distribution to a mating device. The mating device may include a set of mechanically connected low voltage power modules. One example low voltage power module may be a mechanically connected LED module. The mating device may include various mechanically connected configurations, such as

snap fit connections, bolted assemblies, threaded metal inserts, hook and loop type fasteners, molded in threads, push-on/turn-on fasteners, rivets, press-fits, or similar mechanical-type connection devices. The conductive materials may be for example spring contacts or any other similar conductive contact material. The electronics may utilize the distributed power and/or signals.

[0034] As illustrated in one example in **Figures 8 to 9C**, an example low power voltage system 400 is shown. In this example, the low voltage power system 400 is an example lighting system. Those of skill in the art will recognize that any low voltage device or power system may be utilized. The exemplary lighting system 400 may also be a track and connector assembly 400 for use with a retail merchandise display system. The track and connector assembly 400 may include a track 410 and a power connector assembly 450. **Figure 8** illustrates a perspective view of the track and connector assembly 400. **Figure 9A** illustrates a close-up perspective view of the power connector assembly 450. **Figure 9B** illustrates a cross-section perspective view of the power connector assembly 450. **Figure 9C** illustrates a cross-section view of the power connector assembly 450. Generally, the power connector assembly 450 connects to the track 410 both through a mechanical connection and a power connection. The power connector assembly 450 may connect to the track 410 on any part of the track 410.

[0035] The track 410 may include a first end assembly 412 and a second end assembly 414. The first end assembly 412 may be non-powered. The second end assembly 414 may include a powered top portion 416, a powered bottom portion 418, and one or more track power contacts 420. Generally, the powered portion (both top 416 and bottom 418) may provide a power source to the track 410 through the one or more track power contacts 420. The track 410 may include one or more bus bars 424 for the power connection and a mechanical connection track or surface 426 for the mechanical connection. The bus bars 424 may be conductive plates or other surfaces and materials that allow the distribution of power. The mechanical connection track or surface 426 may be any plate or other surfaces and materials for mechanical connections as will be explained in more detail below. Those of skill in the art will recognize that any material, shape, form, or type of conductive material may be utilized for the bus bars 424. Additionally, those of skill in the art will recognize that any material, shape, form, or type of material may be utilized for the mechanical connection track or surface 426. The track 410 may also include a track mounting bracket 422. The track mounting bracket 422 may be utilized to mount to the merchandise display system, thereby allowing the track and connector assembly 400 to attach to the merchandise display system at any preferred location. Those of skill in the art will recognize that the merchandise display system may include multiple tracks 410 and multiple power connector assemblies 450 without departing from this disclosure.

[0036] The power connector 450 may include a hous-

ing which may include a first or left housing 452 and a second or right housing 454. Within the left housing 452 and the right housing 454 may include one or more power connector contacts 456. The power connector contacts 456 may be configured and located in line with the powered bus bars 424 on the track 410. One or more power connector jacks 458 may be electronically connected to the power connector contacts 456. The power connector jacks 458 may then provide power to a low voltage power device. The low voltage power device may include various lighting systems, such as individual LEDs, other lighting sources, powered track devices, or other such similar low voltage power assemblies for a track system.

[0037] Additionally, the power connector 450 may include a mechanical connector 460 or mating device. The mechanical connector 460 may cooperate and engage the mechanical connection track 426 to connect the power connector 450 to the track 410. The mechanical connector 460 and the mechanical connection track 426 may be one of various different mechanical connector assemblies without departing from this disclosure. For example, as shown in **Figures 9A to 9C**, the mechanical connector 460 and the mechanical connection track 426 may be a snap fit connector, and more specifically a cylindrical type snap fit connector. In other examples, the mechanical connector 460 and the mechanical connection track 426 may be a snap fit connector, such as a cantilever beam snap fit connection or a spherical type snap fit connection. Other types of mechanical connections known and used in the art may be utilized between the mechanical connector 460 and the mechanical connection track 426, such as bolted assemblies, threaded metal inserts, hook and loop type fasteners, molded in threads, push-on/turn-on fasteners, rivets, press-fits, or similar mechanical-type connection devices. The mechanical connector 460 may be configured and located in-line with and the mechanical connection track 426 on the track 410 such that the mechanical connector 460 engages and/or cooperates with the mechanical connection track 426 to connect the power connector 450 to the track 410. The mechanical connector 460 allows the power connector 450 and any low voltage power supply assemblies connected to the power connector 450 the ability to be moved along the entire length of the track 410. For example, individual LEDs, other lighting sources, or powered track devices may be utilized with the power connector 450 and be moved along the entire length of the track 410.

[0038] **Figures 10 to 16B** illustrate an exemplary embodiment of the present invention. Specifically, **Figures 10 to 16B** illustrate a low voltage power system used with a merchandising system. Generally, as described above, the low voltage power system includes a distribution track with a tray connected mechanically and for power to the distribution track. In one exemplary embodiment, the tray includes a power connector, with one or more mechanical connector systems with a lighting assembly or lighting bar, such as LEDs or other types of

lights.

[0039] As illustrated in one embodiment in **Figures 10 to 16B**, an exemplary retail merchandise display system is shown. The merchandise display system includes a track and connector assembly 505 which includes a low power voltage system. In this example, the track and connector assembly 505 may include an exemplary lighting system, such as LEDs. Those of skill in the art will recognize that any low voltage power system may be utilized without departing from these embodiments. The track and connector assembly includes a track 510 and a tray assembly 530. The tray assembly 530 includes a power connector 550. Generally, the power connector 550 connects to the track 510 both through a mechanical and a power connection. The power connector 550 may connect to the track 510 on any part of the track 510.

[0040] As illustrated in **Figures 11A to 12B**, the track 510 may include a housing 512 and includes one or more power contacts 514. The track 510 includes a first end 516 and a second end 518. The first end 516 may include a power wire 520 which can be connected to a power source to provide power the power contacts 514. The housing 512 may be configured to extend vertically along a retail merchandise display system. The housing may be made of a plastic extrusion. The one or more power contacts 514 may include contact wires 514A, 514B installed or set into the housing 512. As illustrated in **Figure 12A**, the housing 512 may include curved slots 513 to hold the contact wires 514A, 514B.

[0041] The housing 512 may be non-powered. Generally, the power contacts 514 may provide a power source to the track 510 through the one or more track contact wires 514A, 514B. The power contacts 514 may be conductive wires, rods, or plates or other surfaces and materials that allow the distribution of power. The power contacts 514 may also include any ferrous plate or other surfaces and materials for magnetic connections. Those of skill in the art will recognize that any material, shape, form, or type of conductive material may be utilized for the power contacts 514. Additionally, those of skill in the art will recognize that any material, shape, form, or type of ferrous material may be utilized for the power contacts 514, such as brass.

[0042] The track 510 may also include a track mounting bracket (not shown). The track mounting bracket is utilized to mount the track 510 to the merchandise display system, thereby allowing the track and connector assembly to attach to the merchandise display system at any preferred location. Those of skill in the art will recognize that the merchandise display system may include multiple tracks 510 and multiple power connectors 550 without departing from this disclosure.

[0043] **Figures 13 to 16B** illustrate the tray assembly 530. The tray assembly 530 includes a tray 540. The tray assembly 530 includes a pan 560. The pan 560 may be an existing metal pan already attached to and connected to the merchandise display. The tray 540 is sized and shaped to slide into and or fit with the pan 560. Generally,

the pan 560 includes the structure to support and hold the tray assembly 530 as well as any required products or merchandise. The pan 560 includes arms 562 that attach or connect to the merchandise display system.

[0044] As illustrated in **Figure 14**, the tray 540 includes a front portion, a rear portion, and two sides. Any size or shape of the tray 540 may be utilized without departing from this disclosure. The tray 540 may be rectangular, square, or other shapes without departing from this disclosure. The tray 540 is configured to slide into the pan 560 and held by the pan 560 in the merchandise display system.

[0045] As shown in these embodiments, the tray assembly 530 includes a power connector 550. The power connector 550 includes one or more contact assemblies 552. The contact assembly 552 includes a contact 554, a wire harness 556, and a power jack 558. The contact 554 may be located near the rear portion of the tray 540. The power jack 558 may be located near or at the front portion of the tray 540 and near or at a lighting source or LED printed circuit board assembly. The wire harness 556 extends between the contact 554 at the rear portion of the tray 540 to the power jack 558 at the LED printed circuit board assembly. As shown in **Figures 15A and 15B**, the contact assembly 552 may include a right hand contact assembly 552A and a left hand contact assembly 552B.

[0046] Additionally, the power connector 550 includes a mechanical connector 550A or mating device or the power connector 550 works as a mechanical connector 550A. The mechanical connector 550A cooperates and engages the track 510 to connect the power connector 550 to the track 510. The mechanical connector 550A and the track 510 may be one of various different mechanical connector assemblies without departing from this disclosure. For example, the mechanical connector 550A and the track 510 and may be a snap fit connector, and more specifically a clip-type snap fit connector. In other examples of this embodiment, the mechanical connector 550A and the track 510 may be a cylindrical type snap fit connector. In other examples of this embodiment, the mechanical connector 550A and the track 510 may be a snap fit connector, such as a cantilever beam snap fit connection or a spherical type snap fit connection. Other types of mechanical connections known and used in the art may be utilized between the mechanical connector 550A and the track 510, such as bolted assemblies, threaded metal inserts, hook and loop type fasteners, molded in threads, push-on/turn-on fasteners, rivets, press-fits, or similar mechanical-type connection devices. The mechanical connector 550A may be configured and located in-line with and on the track 510 such that the mechanical connector 550A engages and/or cooperates with the track 510 to connect the power connector 550A to the track 510. The mechanical connector 550A allows the power connector 550 and any low voltage power supply assemblies connected to the power connector 550 the ability to be moved along the entire length of the

track 510. For example, individual LEDs, other lighting sources, or powered track devices may be utilized with the power connector 550 and be moved along the entire length of the track 510.

[0047] The tray assembly 530 may also include a lighting source. As illustrated in **Figures 16A and 16B** the tray assembly 530 includes a LED printed circuit board assembly lighting source 532. The LED printed circuit board assembly 532 may be located at or near the front portion of the tray 540. The LED printed circuit board assembly 532 may extend across the entire front portion of the tray 540. In other embodiments of the present invention, the LED printed circuit board assembly 532 may extend across a portion of the front portion of the tray 540. The LED printed circuit board assembly 532 may be located at various other locations of the merchandise display without departing from this disclosure.

[0048] The LED printed circuit board assembly 532 may include various LED light sources 534 to illuminate the merchandise display system. Additionally, the LED printed circuit board assembly 532 may include metal clips 536 or ends. The metal clips may attach or connect to the ends of the LED printed circuit board assembly 532 and the power jack 558 of the contact assembly 552. The connection from the power wire 520 to the power contacts 514 to the contact assembly 552 with the contact 554, the wire harness 556, and the power jack 558, and finally through to the metal clip 536 powers the LEDs 534 on the printed circuit board assembly 532.

[0049] As is described and detailed above, any low voltage power source may be powered by an embodiment of the present invention, not just an LED printed circuit board assembly. For example, the connection from the power wire 520 to the power contacts 514 to the contact assembly 552 with the contact 554, the wire harness 556, and the end contact 558, and finally through to the metal clip 536 may power any other low voltage power source. The low voltage power source may include various lighting systems, such as individual LEDs or other such similar low voltage power assemblies for the merchandise display system.

[0050] The tray assembly 530 may also include a flip front portion 570 that allows the description and/or labeling of products and/merchandise. The flip front portion 570 may be located towards the front portion of the tray 540. The flip front portion 570 may include a clear lens such that the light from the LEDs 534 may be illuminated through the flip front portion 570. The flip front portion 570 may also flip up and down as required to assist with the merchandise display system.

[0051] The reader should understand that the scope of the present invention is defined by the scope of the appended claims. Many variations in the merchandise display may be made from the specific structures described above without departing from the scope of the present invention as defined by the scope of the appended claims.

[0052] While the present invention has been described

in detail in terms of presently preferred modes of carrying out the present invention, those skilled in the art will appreciate that there are numerous variations and permutations of the above described merchandise display that may fall within the scope of the present invention as defined by the scope of the appended claims.

Claims

1. A merchandise display comprising:

a merchandise display system comprising a track mounting bracket to mount a track (510) and means for receiving arms (562), the track (510) includes a first end (516) and a second end (518) opposite the first end (516), wherein the track (510) is powered from a low voltage power source, and a tray assembly (530) configured for displaying products and connecting to the merchandise display system, the tray assembly (530) including a pan (560) with the arms (562) for attachment to the merchandise display system, a tray (540) to slide into or fit within the pan (560) and a power connector assembly (550) located on the tray (540); wherein the power connector assembly (550) connects to the track (510) both through a mechanical connector (550A) and a low voltage power connection (514), and includes one or more power contact assemblies (552), each power contact assembly (552) including a contact (554), a wire harness (556), and a power jack (558), and provides low voltage power through the track (510) to a low voltage power device, and the mechanical connector (550A) allows the power connector assembly (550) and any low voltage power supply assemblies (552) connected to the power connector assembly (550) to be moved along an entire length of the track (510).

2. The merchandise display of claim 1, wherein the first end (516) is a powered end and the second end (518) is a non-powered end.

3. The merchandise display of claim 1, wherein the track (510) includes one or more conductive rods (514) that connect to the power connector assembly (550) providing the low voltage power connection.

4. The merchandise display of claim 3, wherein the track (510) is oriented to extend along a vertical direction of the merchandise display system.

5. The merchandise display of claim 1, wherein the mechanical connection (550A) is a snap-fit connection.

6. The merchandise display of claim 5, wherein the snap-fit connection is a metal clip-type snap fit connection.
7. The merchandise display of claim 1, wherein the low voltage power device is a LED lighting system configured for the merchandise display system.
8. The merchandise display of claim 1, comprising:
 - a track (510) that includes one or more conductive rods (514) adjacent to one another, and a printed circuit board that connects to the power jack (558) of the power connector assembly (550),
 - wherein the printed circuit board is configured to provide power to a power device.
9. The merchandise display of claim 8, wherein the power connector assembly (550) includes one or more contacts (514A, 514B) that connect to the one or more conductive rods (514) on the track (510) providing the power connection.
10. The merchandise display of claim 8, wherein the one or more conductive rods (514) are made of brass.
11. The merchandise display of claim 8, wherein the track (510) includes a housing that provides the mechanical connector (550A).
12. The merchandise display of claim 11, wherein the housing and the power connector assembly (550) cooperate together to form a snap-fit connection.
13. The merchandise display of claim 12, wherein the snap-fit connection is a metal clip-type snap fit connection.
14. The merchandise display of claim 8, wherein the power device is a LED lighting system configured to illuminate the merchandise display system.
15. The merchandise display of claim 1, wherein the tray assembly (530) further comprises a flip front portion (570), wherein the flip front portion (570) allows for the labelling of products.

Patentansprüche

1. Warenverkaufsstände, der aufweist:

Warenverkaufsständersystem, das eine Schienenbefestigungshalterung aufweist, um eine Schiene (510) zu befestigen und Mittel, um Arme (562) aufzunehmen, wobei die Schiene (510) ein erstes Ende (516)

und ein zweites Ende (518) gegenüberliegend zum ersten Ende (516) aufweist, wobei die Schiene (510) über eine Niederspannungs-Stromquelle versorgt wird, und eine Fachbaugruppe (530), die dazu ausgelegt ist, Produkte auszustellen und mit dem Warenverkaufsständersystem verbunden zu sein, wobei die Fachbaugruppe (530) aufweist eine Wanne (560) mit Armen (562) zur Anbringung am Warenverkaufsständersystem, ein Fach (540), um in die Wanne (560) geschoben oder darin eingepasst zu werden, und eine Stromanschlussbaugruppe (550), die sich an dem Fach (540) befindet; wobei die Stromanschlussbaugruppe (550) sowohl über ein mechanisches Verbindungselement (550A) als auch über einen Niederspannungs-Stromanschluss (514) mit der Schiene (510) verbunden ist, und eine oder mehrere Stromkontaktbaugruppen (552) aufweist, wobei jede Stromkontaktbaugruppe (552) einen Kontakt (554), einen Kabelbaum (556) und einen Netzanschluss (558) aufweist, und über die Schiene (510) eine Niederspannungsleistung für eine Niederspannungs-Stromvorrichtung bereitstellt, und das mechanische Verbindungselement (550A) ermöglicht, dass die Stromanschlussbaugruppe (550) und beliebige Niederspannungs-Stromversorgungsbaugruppen (552), die mit der Stromanschlussbaugruppe (550) verbunden sind, entlang einer Gesamtlänge der Schiene (510) bewegbar sind.

2. Warenverkaufsstände nach Anspruch 1, wobei das erste Ende (516) ein strombetriebenes Ende ist und das zweite Ende (518) ein nicht strombetriebenes Ende ist.
3. Warenverkaufsstände nach Anspruch 1, wobei die Schiene (510) eine oder mehrere leitfähige Stangen (514) aufweist, die mit der Stromanschlussbaugruppe (550) verbunden sind, die den Niederspannungs-Stromanschluss bereitstellt.
4. Warenverkaufsstände nach Anspruch 3, wobei die Schiene (510) ausgerichtet ist, um entlang einer vertikalen Richtung des Warenverkaufsständersystems zu verlaufen.
5. Warenverkaufsstände nach Anspruch 1, wobei das mechanische Verbindungselement (550A) eine Schnappverbindung ist.
6. Warenverkaufsstände nach Anspruch 5, wobei die Schnappverbindung eine Schnappverbindung von einem Metallclip-Typ ist.
7. Warenverkaufsstände nach Anspruch 1, wobei die

Niederspannungs-Stromvorrichtung ein LED-Beleuchtungssystem ist, das für das Warenverkaufsständersystem ausgelegt ist.

8. Warenverkaufsständersystem nach Anspruch 1, das aufweist:

eine Schiene (510), die eine oder mehrere nebeneinander angeordnete leitfähige Stangen (514) und eine Leiterplatte aufweist, die mit der Strombuchse (558) der Stromanschlussbaugruppe (550) verbunden ist, wobei die Leiterplatte dazu ausgelegt ist, für eine Stromvorrichtung Strom bereitzustellen.
9. Warenverkaufsständer nach Anspruch 8, wobei die Stromanschlussbaugruppe (550) einen oder mehrere Kontakte (514A, 514B) aufweist, die mit der einen oder den mehreren leitfähigen Stangen (514) an der Schiene (510) verbunden sind, die den Stromanschluss bereitstellt bzw. bereitstellen.
10. Warenverkaufsständer nach Anspruch 8, wobei die eine oder die mehreren leitfähigen Stangen (514) aus Messing hergestellt sind.
11. Warenverkaufsständer nach Anspruch 8, wobei die Schiene (510) ein Gehäuse aufweist, das das mechanische Verbindungselement (550A) bereitstellt.
12. Warenverkaufsständer nach Anspruch 11, wobei das Gehäuse und die Stromanschlussbaugruppe (550) miteinander zusammenwirken, um eine Schnappverbindung zu bilden.
13. Warenverkaufsständer nach Anspruch 12, wobei die Schnappverbindung eine Schnappverbindung des Metallclip-Typs ist.
14. Warenverkaufsständer nach Anspruch 8, wobei die Stromvorrichtung ein LED-Beleuchtungssystem ist, das dazu ausgelegt ist, das Warenverkaufsständersystem zu beleuchten.
15. Warenverkaufsständersystem nach Anspruch 1, wobei die Fachbaugruppe (530) weiterhin einen vorderen Klappbereich (570) aufweist, wobei der vordere Klappbereich (570) die Bezeichnung der Produkte ermöglicht.

Revendications

1. Présentoir de marchandises comprenant :

un système de présentoir de marchandises comprenant un support de montage de voie pour monter une voie (510) et un moyen destiné à

recevoir des bras (562),
la voie (510) inclut une première extrémité (516) et une deuxième extrémité (518) opposée à la première extrémité (516), où la voie (510) est alimentée par une source d'alimentation basse tension, et
un ensemble de chariot (530) configuré pour présenter des produits et être relié au système de présentoir de marchandises, l'ensemble de chariot (530) incluant un bac (560) avec les bras (562) pour une fixation sur le système de présentoir de marchandises, un chariot (540) destiné à coulisser dans ou à s'emboîter dans le bac (560) et un ensemble de connecteur d'alimentation (550) situé sur le chariot (540) ; où l'ensemble de connecteur d'alimentation (550) est connecté à la voie (510) à la fois par un connecteur mécanique (550A) et une connexion d'alimentation basse tension (514), et inclut un ou plusieurs ensembles de contact d'alimentation (552), chaque ensemble de contact d'alimentation (552) incluant un contact (554), un faisceau de fils (556), et une prise d'alimentation (558), et fournit une alimentation basse tension par le biais de la voie (510) à un dispositif d'alimentation basse tension, et
le connecteur mécanique (550A) permet à l'ensemble de connecteur d'alimentation (550) et à tous les ensembles d'alimentation basse tension (552) reliés à l'ensemble de connecteur d'alimentation (550) d'être déplacés sur toute la longueur de la voie (510).

2. Présentoir de marchandises selon la revendication 1, dans lequel la première extrémité (516) est une extrémité alimentée et la deuxième extrémité (518) est une extrémité non alimentée.
3. Présentoir de marchandises selon la revendication 1, dans lequel la voie (510) inclut une ou plusieurs tiges conductrices (514) qui sont connectées à l'ensemble de connecteur d'alimentation (550) fournissant la connexion d'alimentation basse tension.
4. Présentoir de marchandises selon la revendication 3, dans lequel la voie (510) est orientée de sorte à s'étendre le long d'une direction verticale du système de présentoir de marchandises.
5. Présentoir de marchandises selon la revendication 1, dans lequel la connexion mécanique (550A) est une connexion à emboîtement.
6. Présentoir de marchandises selon la revendication 5, dans lequel la connexion à emboîtement est une connexion à emboîtement de type à élément à encliqueter métallique.

7. Présentoir de marchandises selon la revendication 1, dans lequel le dispositif d'alimentation basse tension est un système d'éclairage à DEL configuré pour le système de présentoir de marchandises. 5
8. Présentoir de marchandises selon la revendication 1, comprenant :
 - une voie (510) qui inclut une ou plusieurs tiges conductrices (514) adjacentes les unes aux autres, et une carte de circuit imprimé qui est connectée à la prise d'alimentation (558) de l'ensemble de connecteur d'alimentation (550), où la carte de circuit imprimé est configurée pour fournir une alimentation à un dispositif d'alimentation. 10 15
9. Présentoir de marchandises selon la revendication 8, dans lequel l'ensemble de connecteur d'alimentation (550) inclut un ou plusieurs contacts (514A, 514B) qui sont connectés aux une ou plusieurs tiges conductrices (514) sur la voie (510) fournissant la connexion d'alimentation. 20
10. Présentoir de marchandises selon la revendication 8, dans lequel les une ou plusieurs tiges conductrices (514) sont en laiton. 25
11. Présentoir de marchandises selon la revendication 8, dans lequel la voie (510) inclut un logement qui fournit le connecteur mécanique (550A). 30
12. Présentoir de marchandises selon la revendication 11, dans lequel le logement et l'ensemble de connecteur d'alimentation (550) coopèrent ensemble pour former une connexion à emboîtement. 35
13. Présentoir de marchandises selon la revendication 12, dans lequel la connexion à emboîtement est une connexion à emboîtement de type à élément à encliqueter métallique. 40
14. Présentoir de marchandises selon la revendication 8, dans lequel le dispositif d'alimentation est un système d'éclairage à DEL configuré pour éclairer le système de présentoir de marchandises. 45
15. Présentoir de marchandises selon la revendication 1, dans lequel l'ensemble de chariot (530) comprend en outre une partie avant à rabat (570), où la partie avant à rabat (570) permet l'étiquetage de produits. 50

55

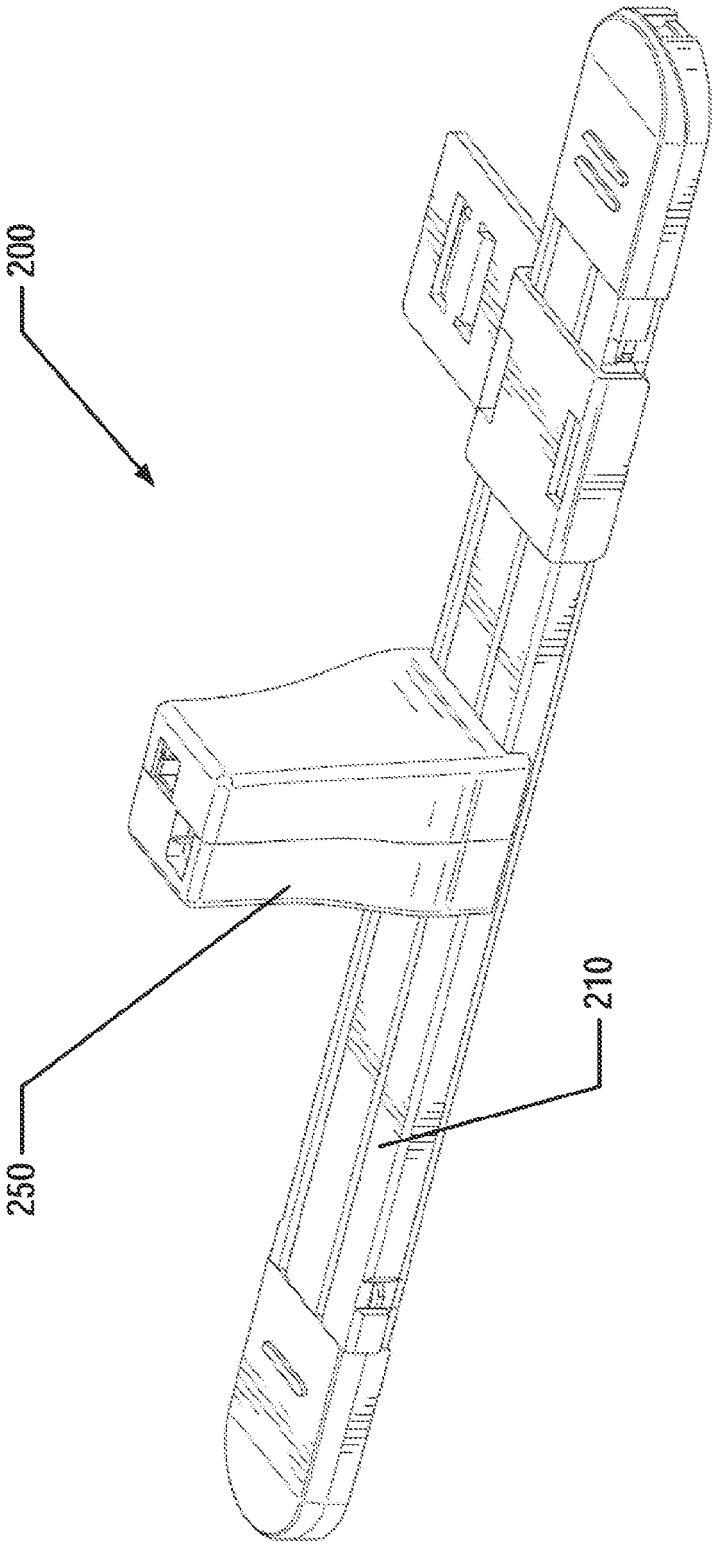


Figure 1

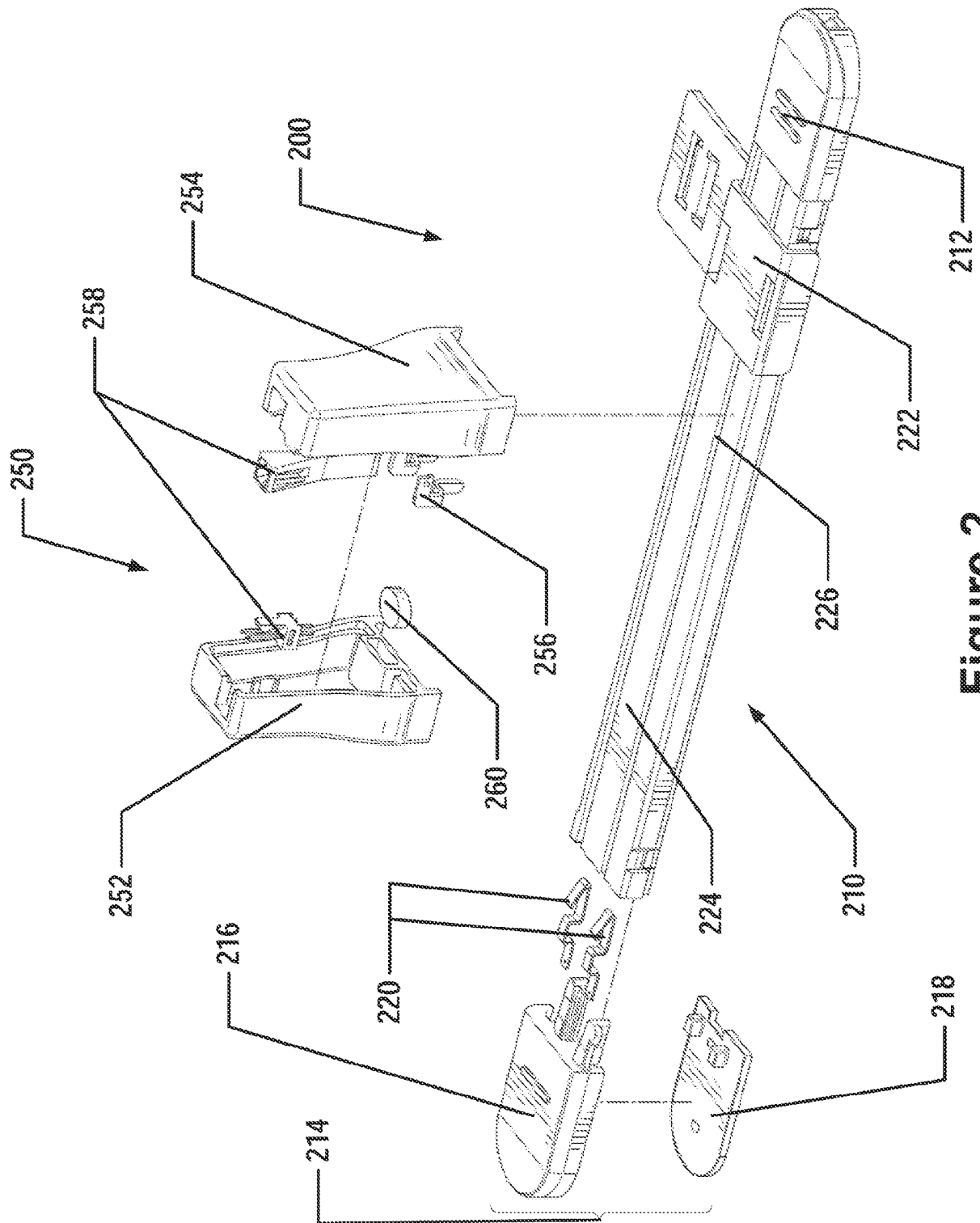


Figure 2

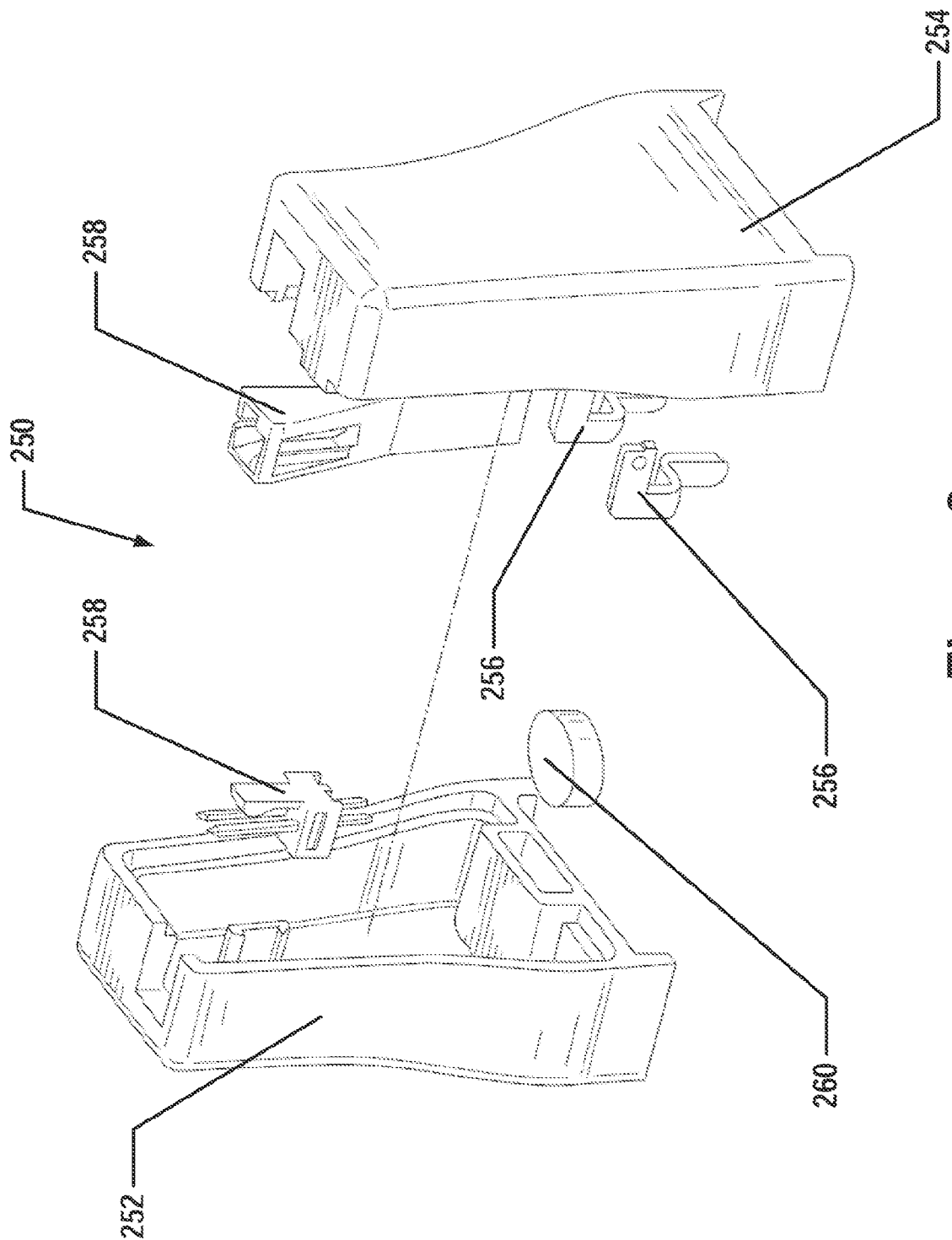


Figure 3

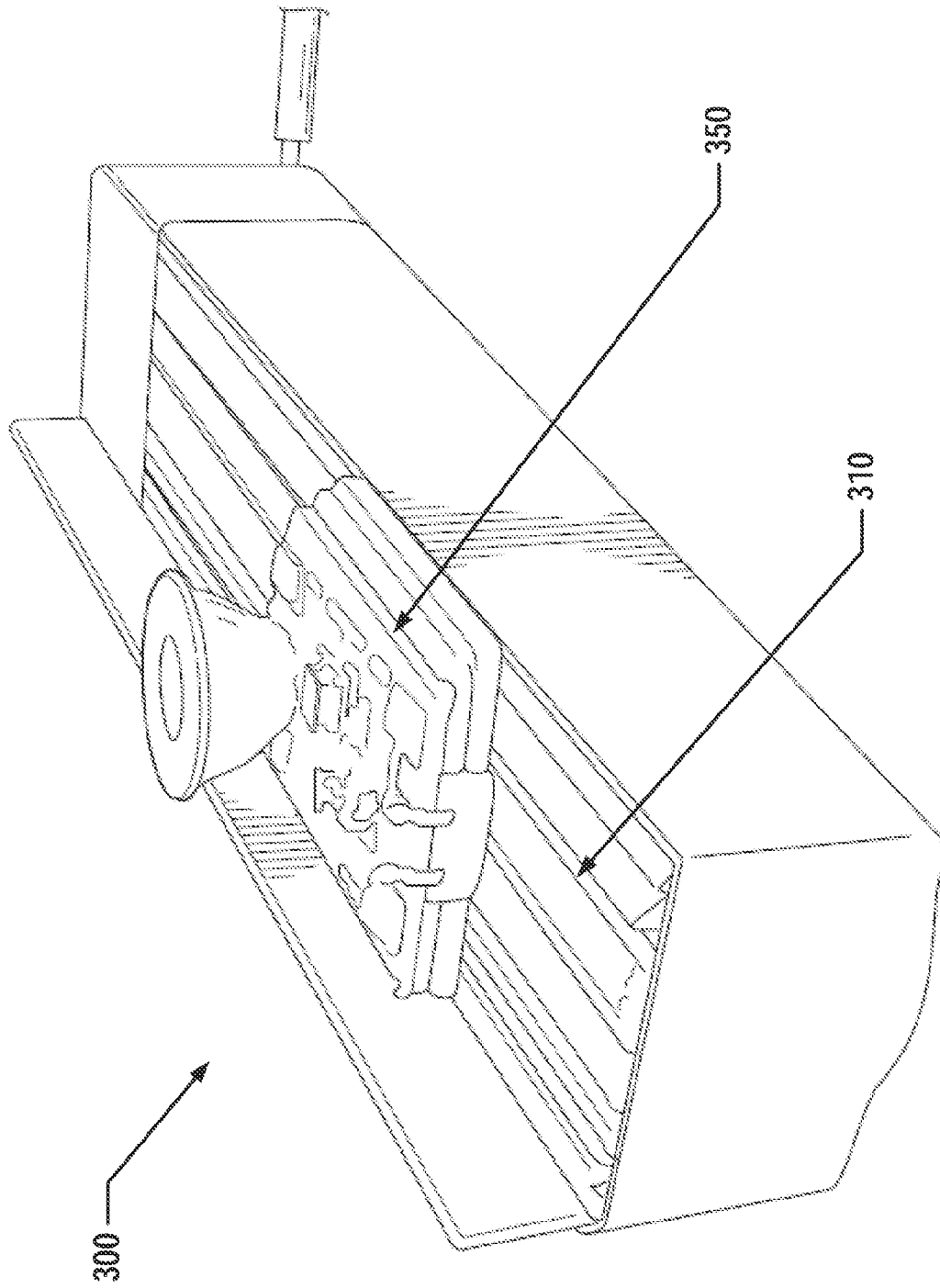


Figure 4

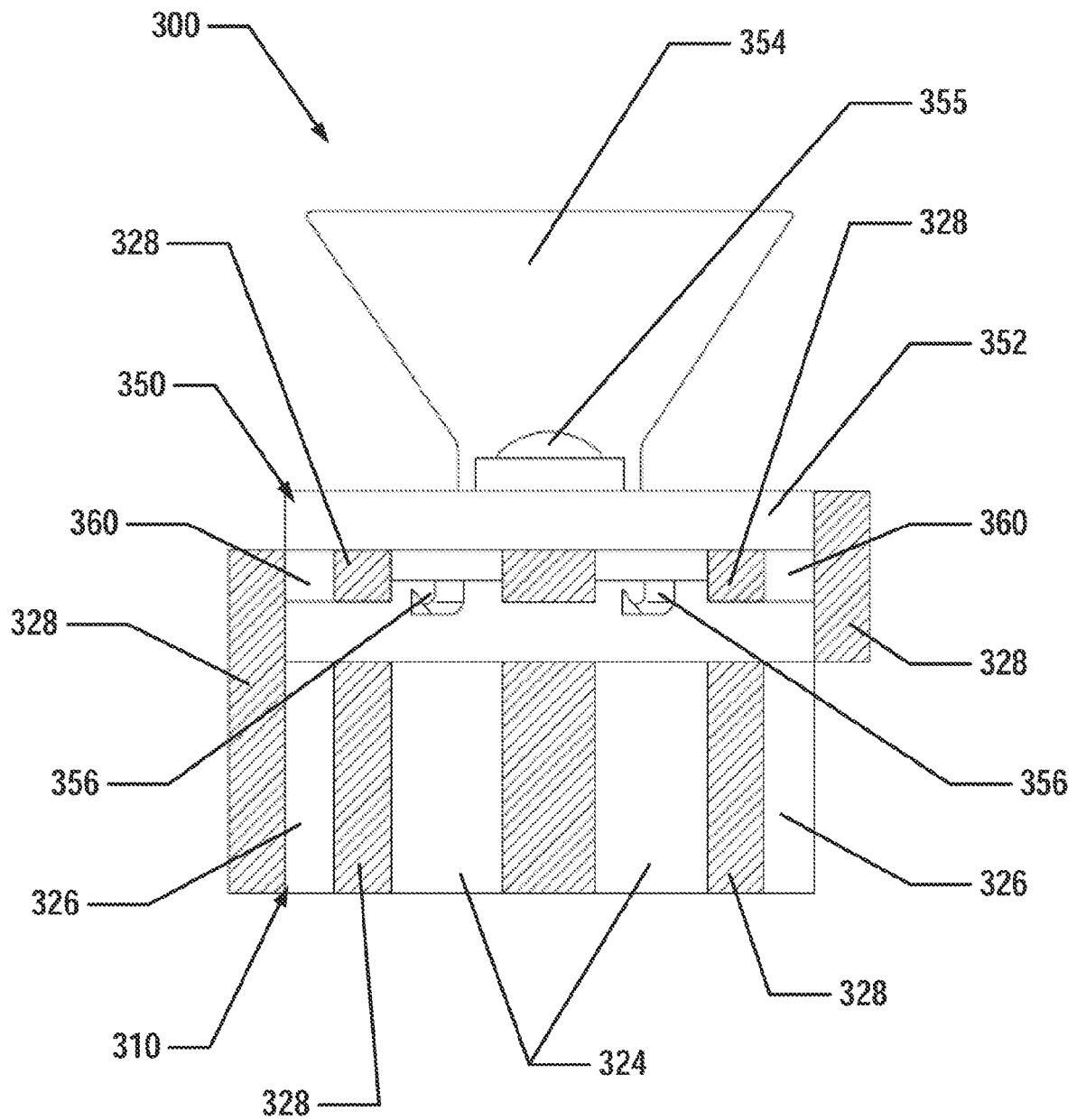


Figure 5

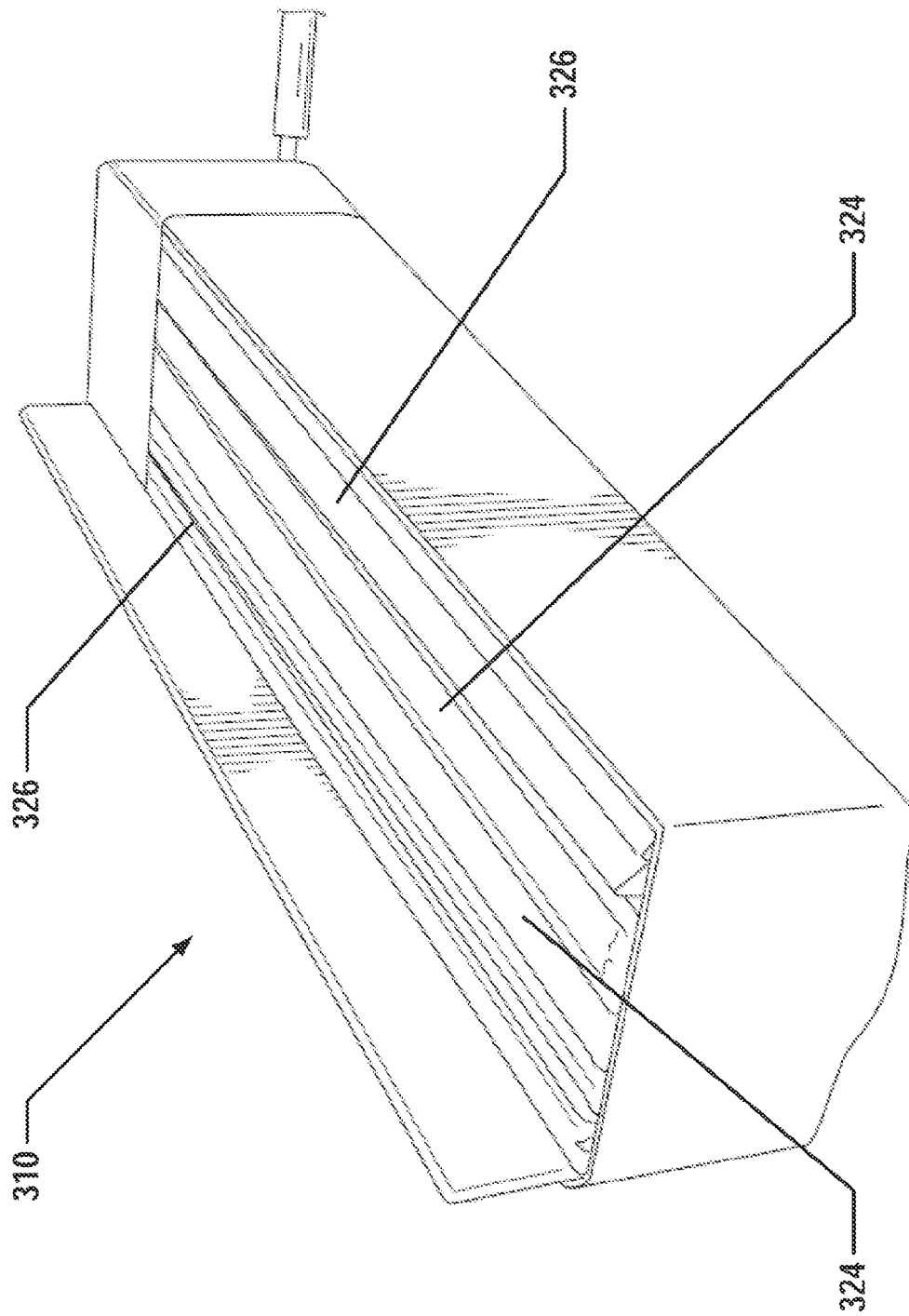


Figure 6

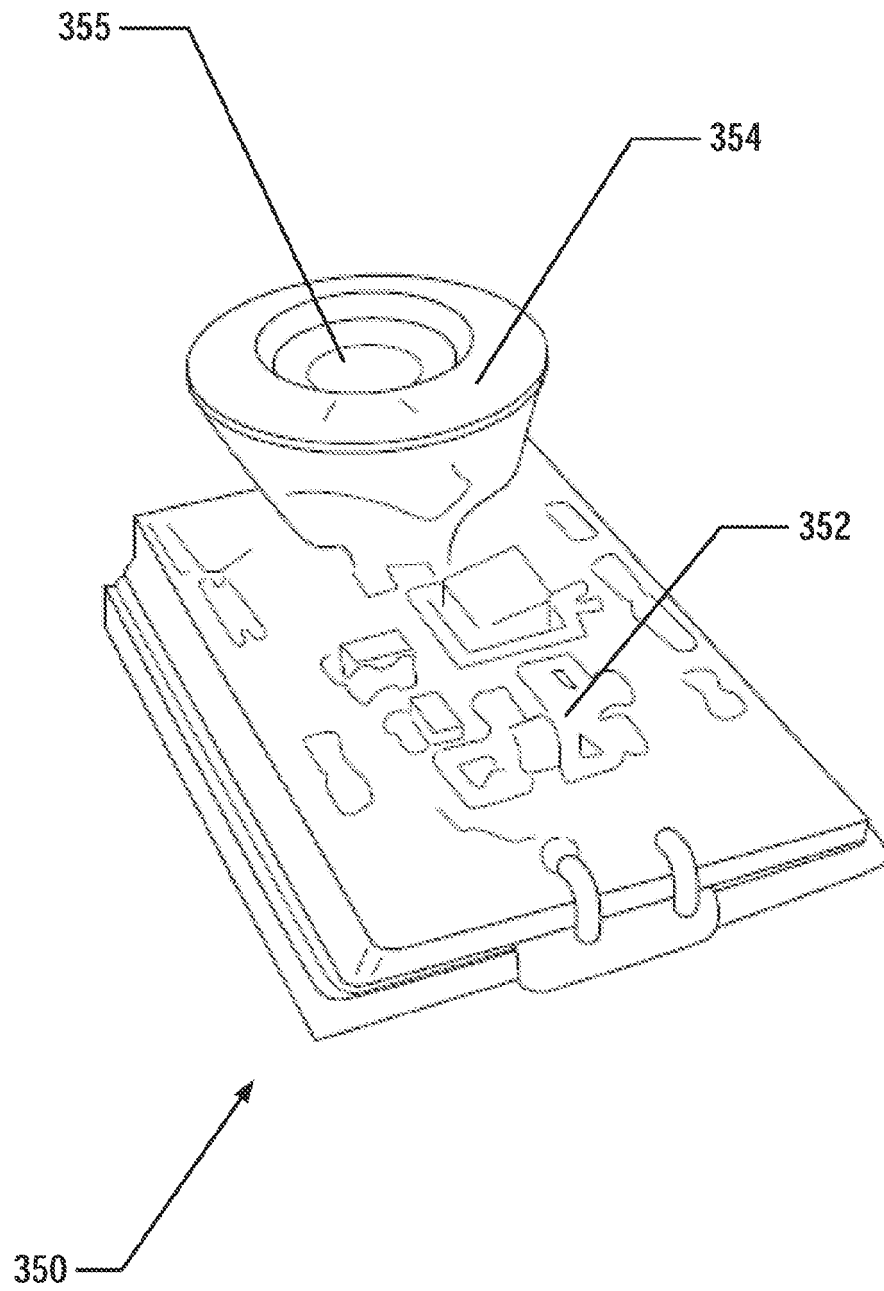


Figure 7

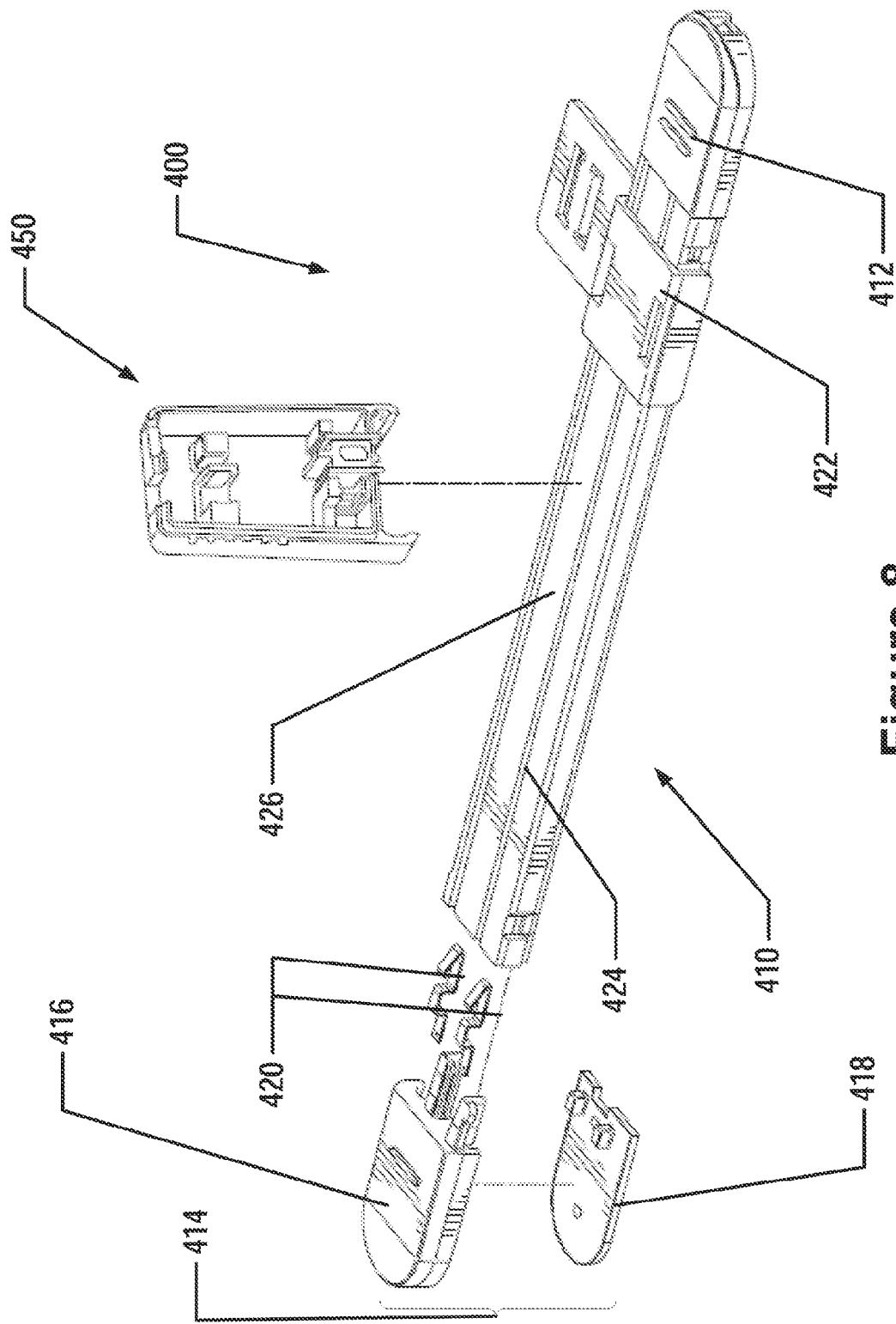


Figure 8

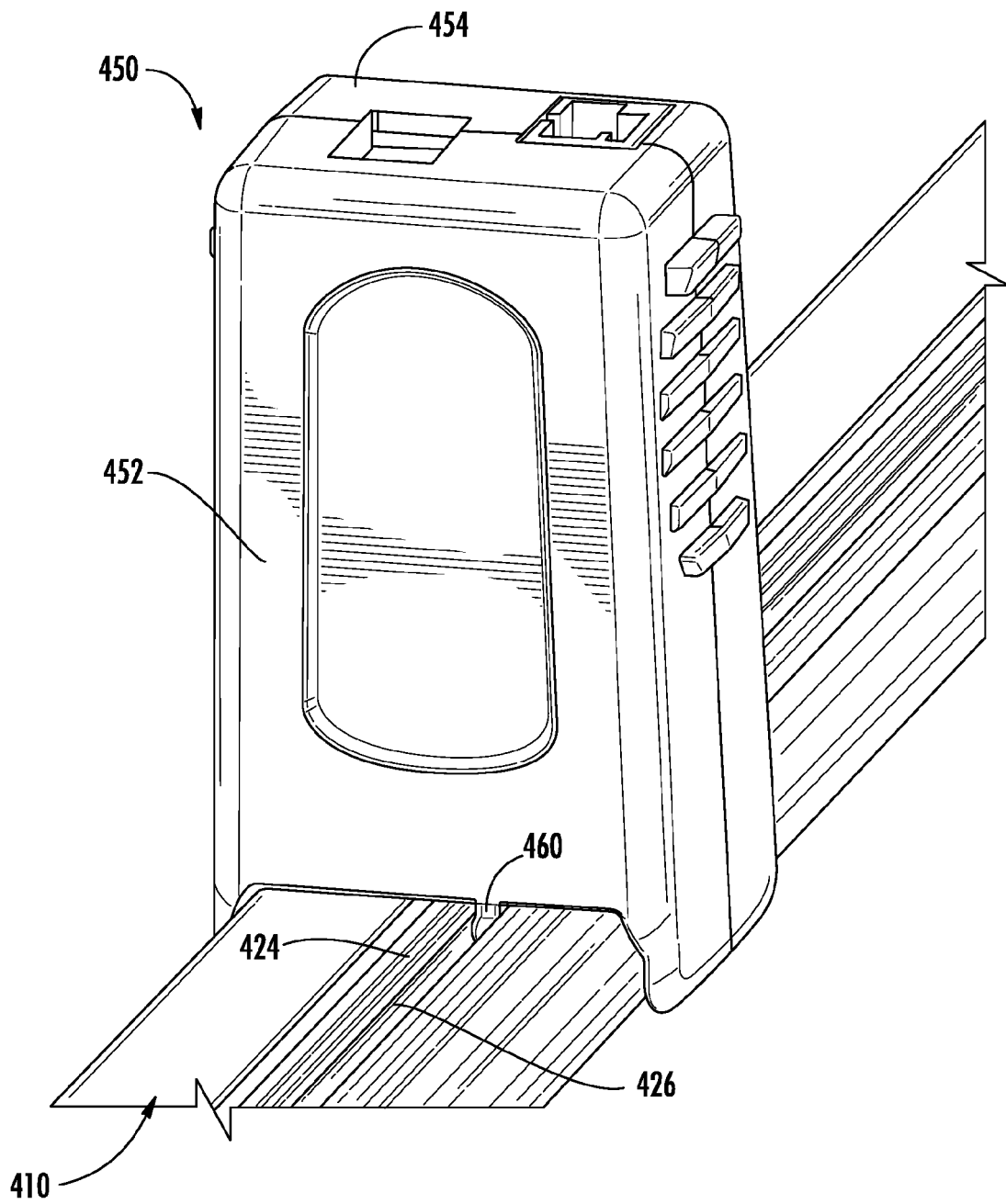


Figure 9A

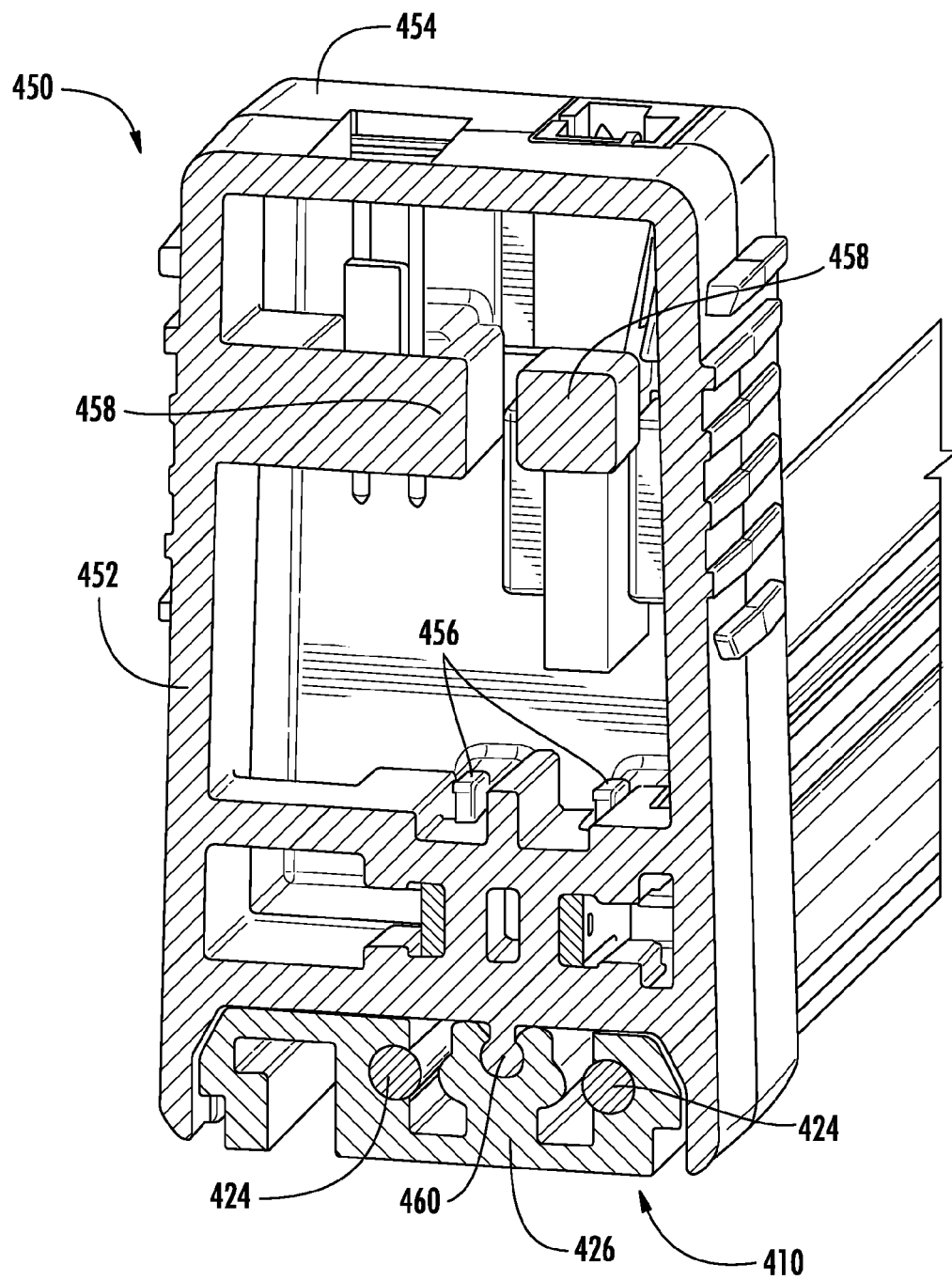


Figure 9B

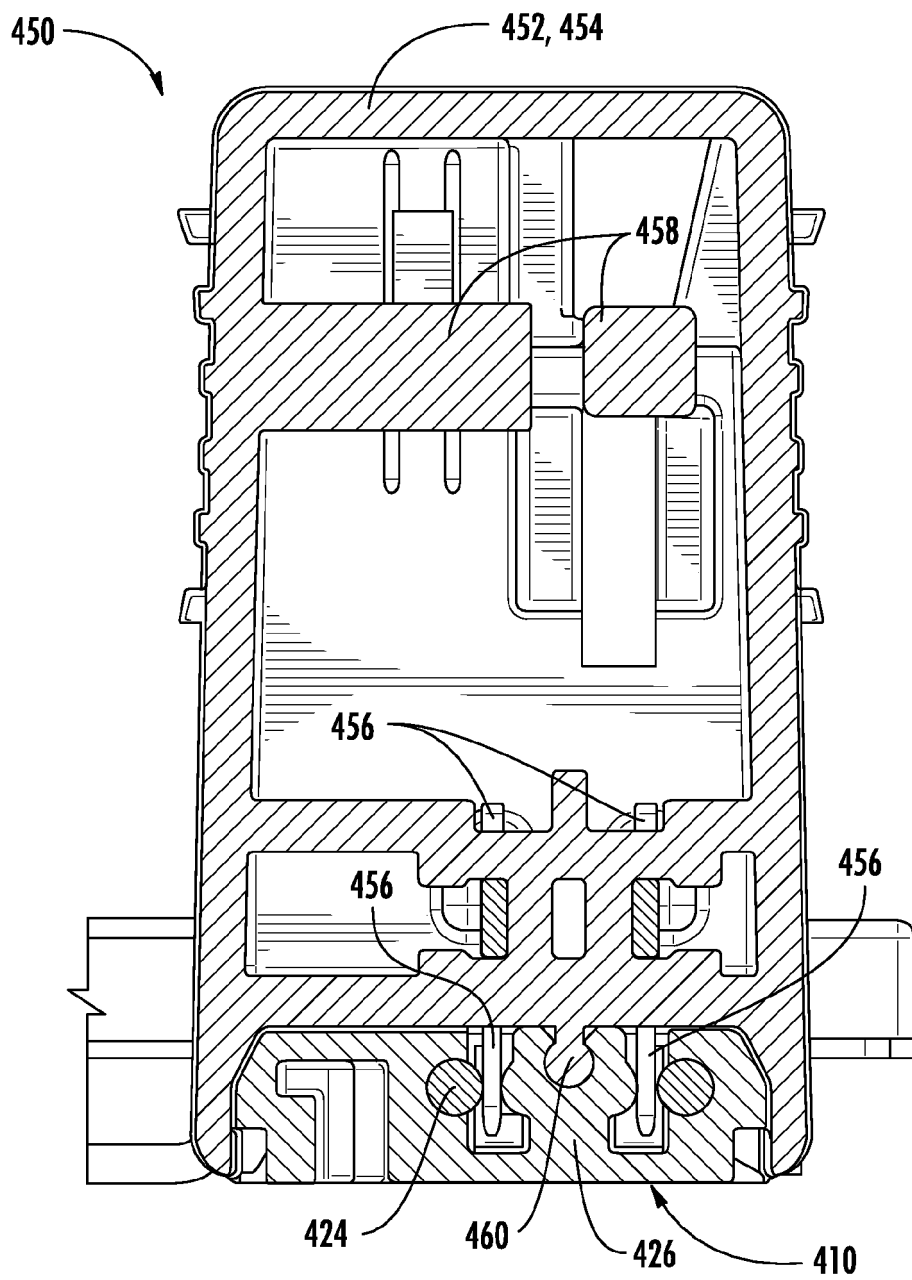


Figure 9C

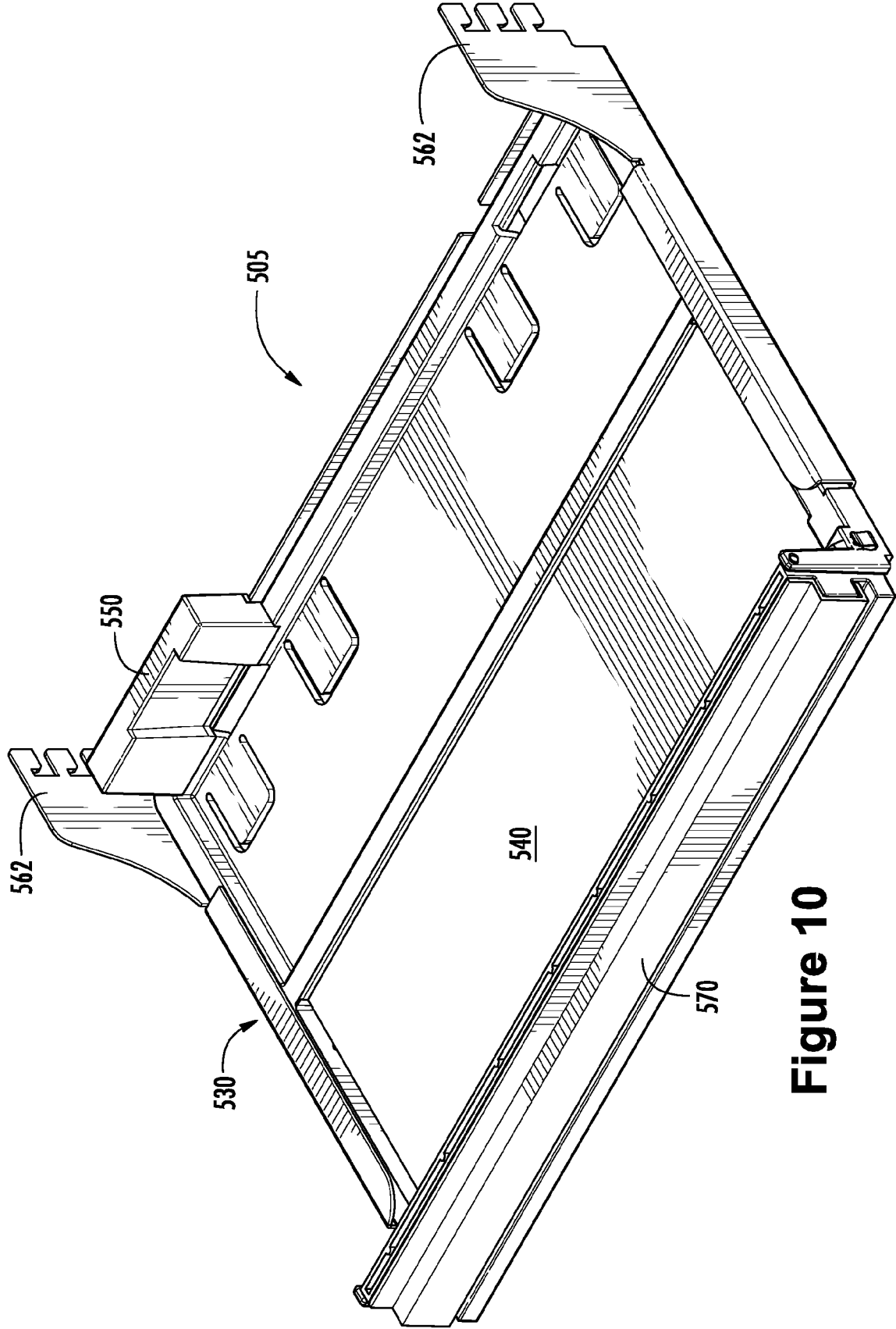
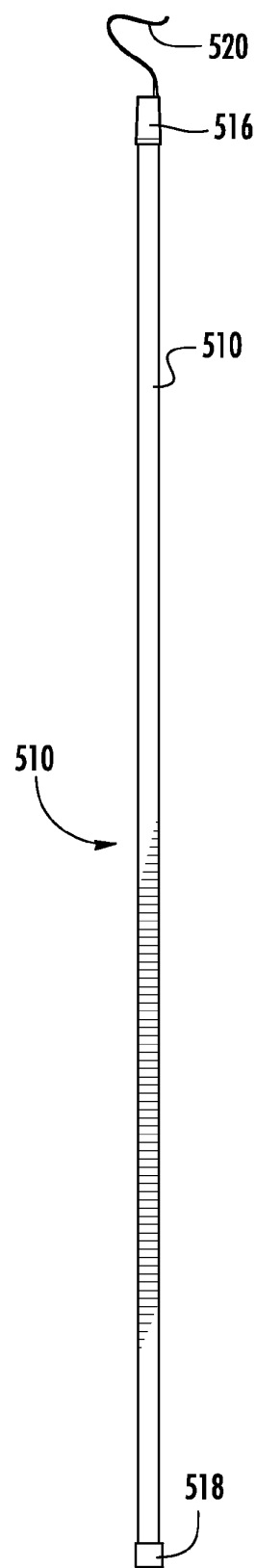
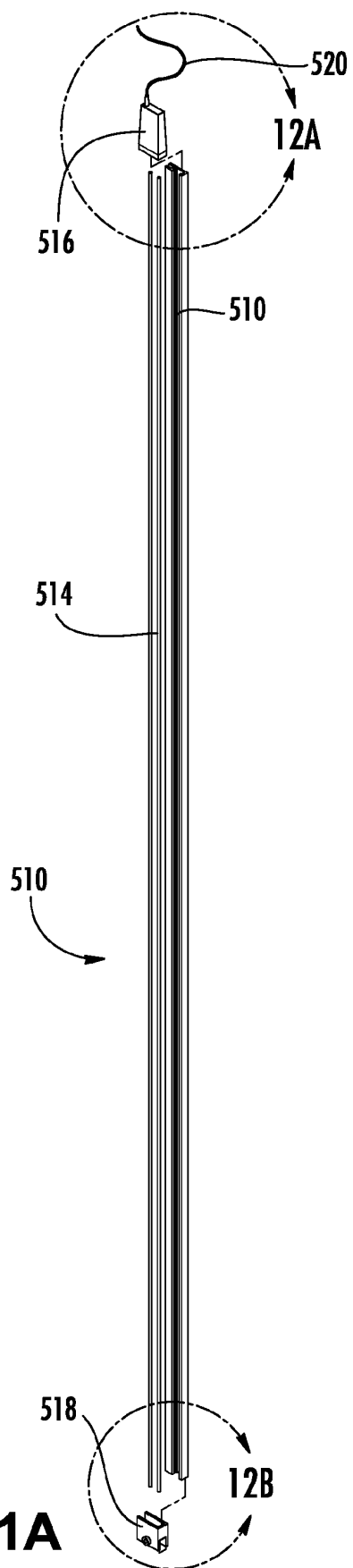


Figure 10



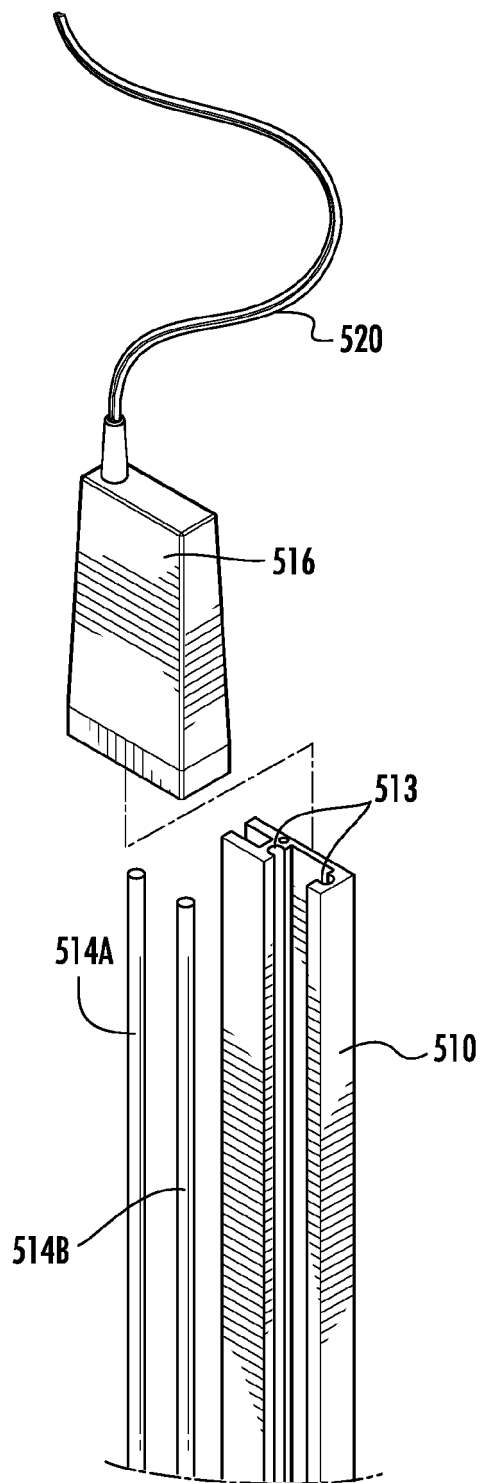


Figure 12A

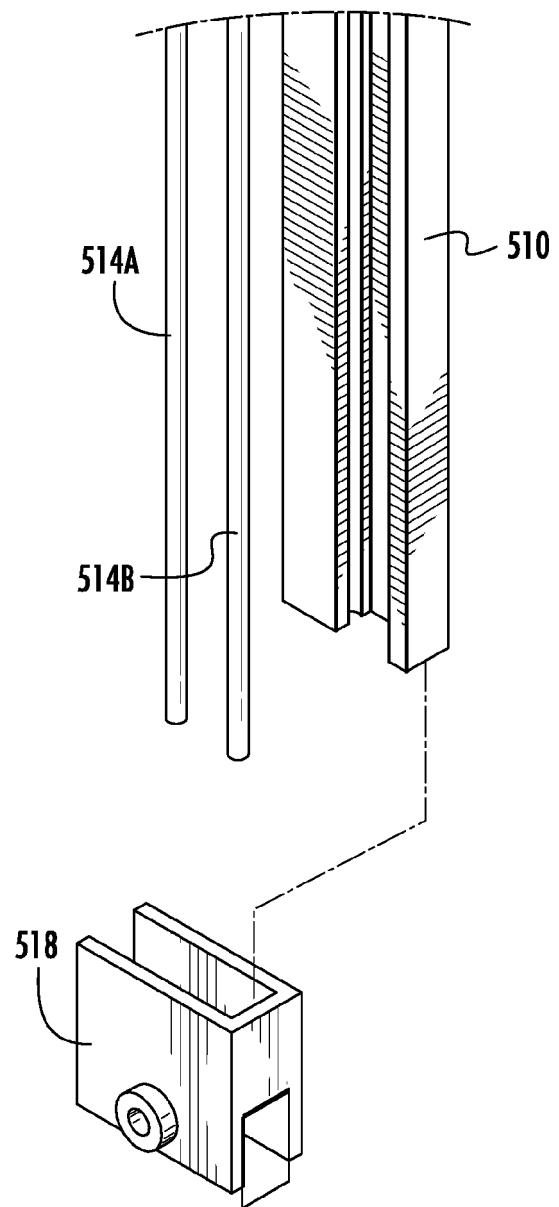


Figure 12B

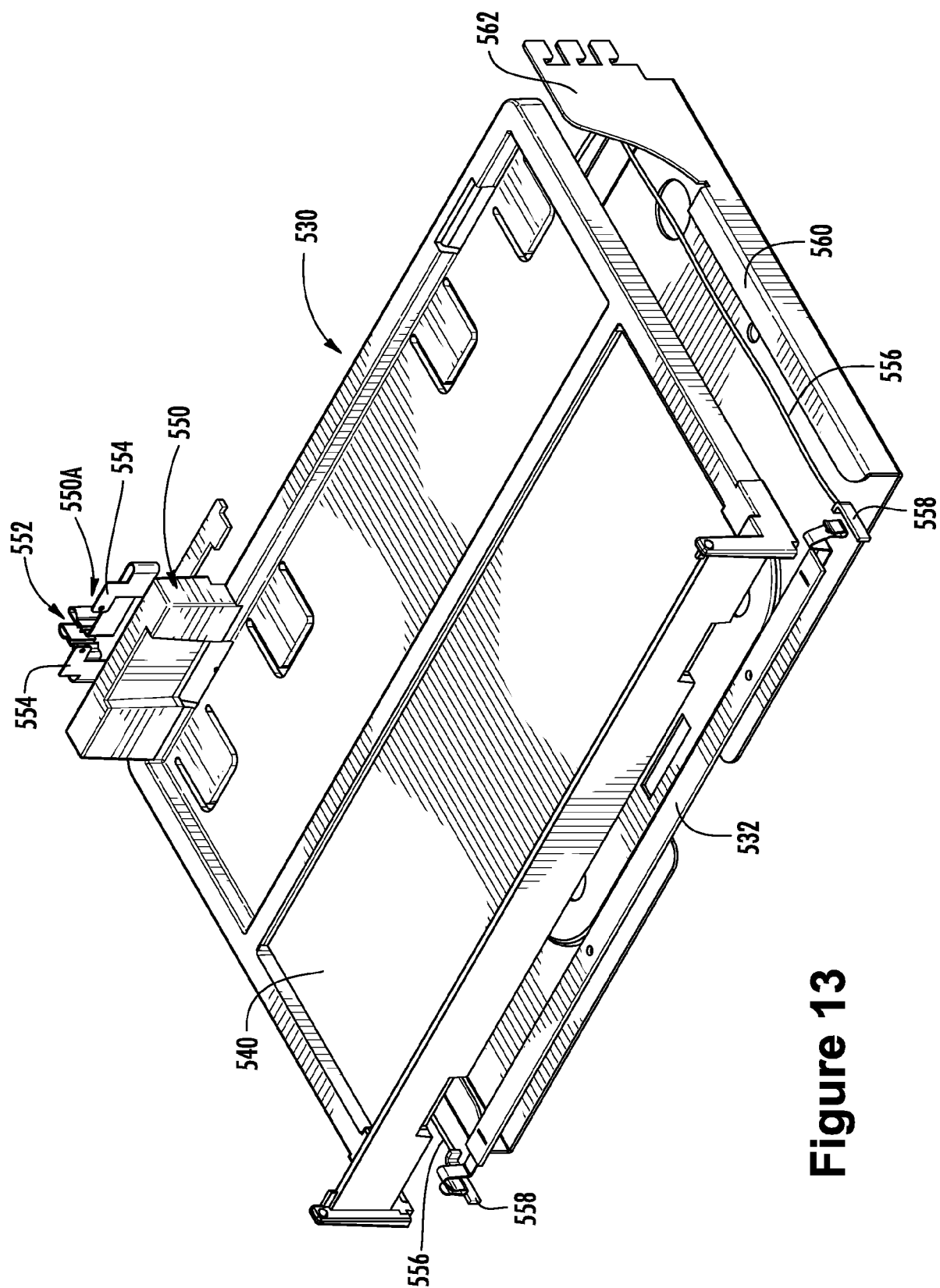


Figure 13

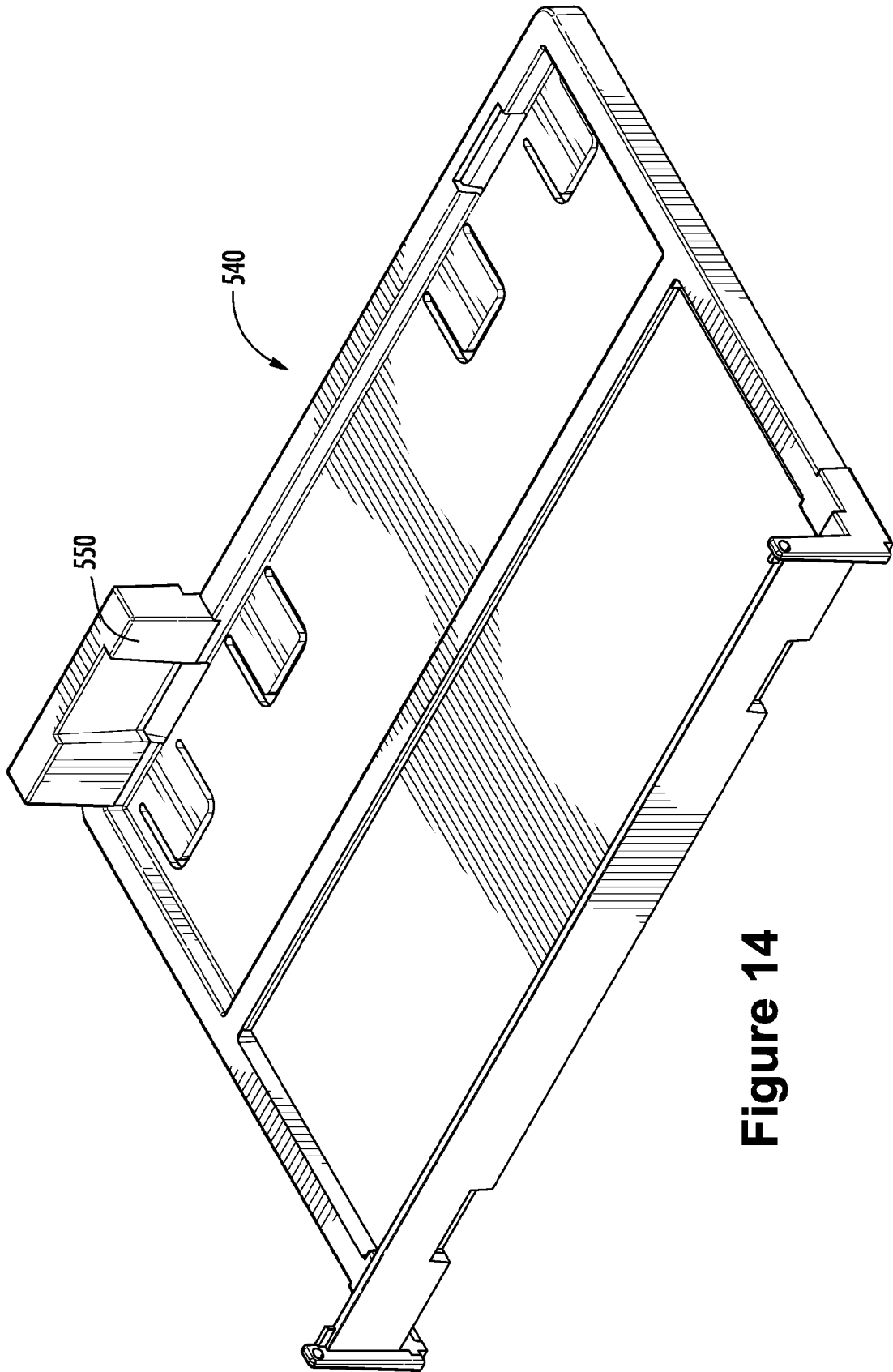


Figure 14

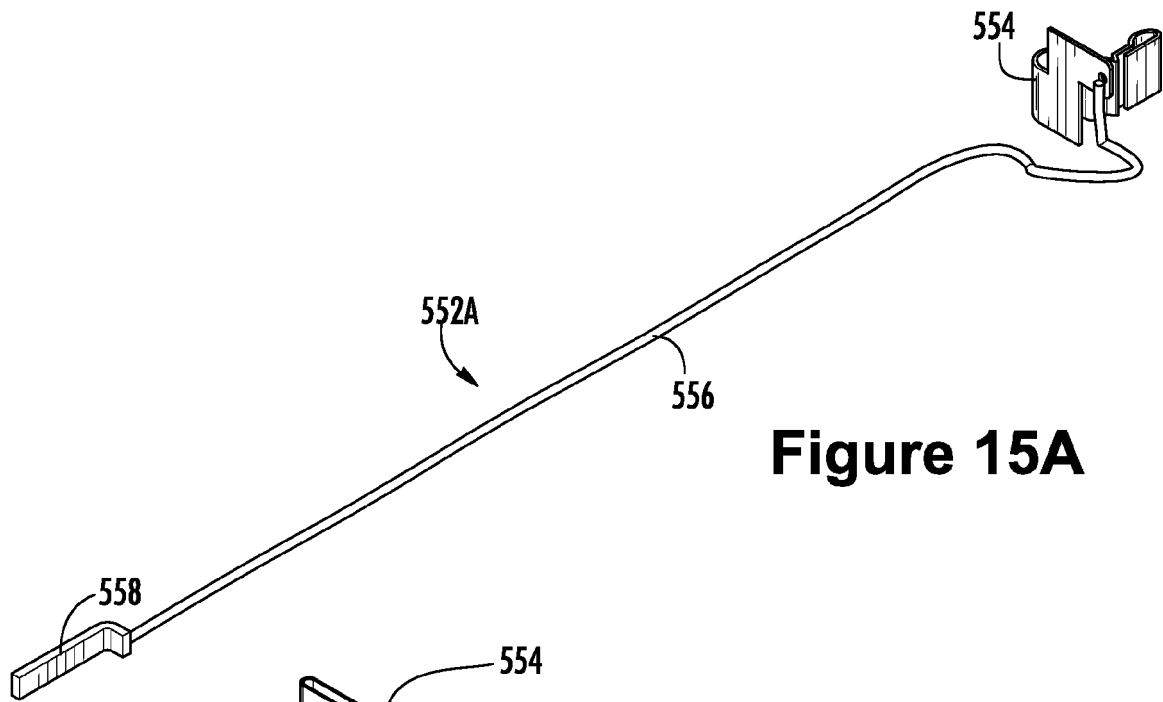


Figure 15A

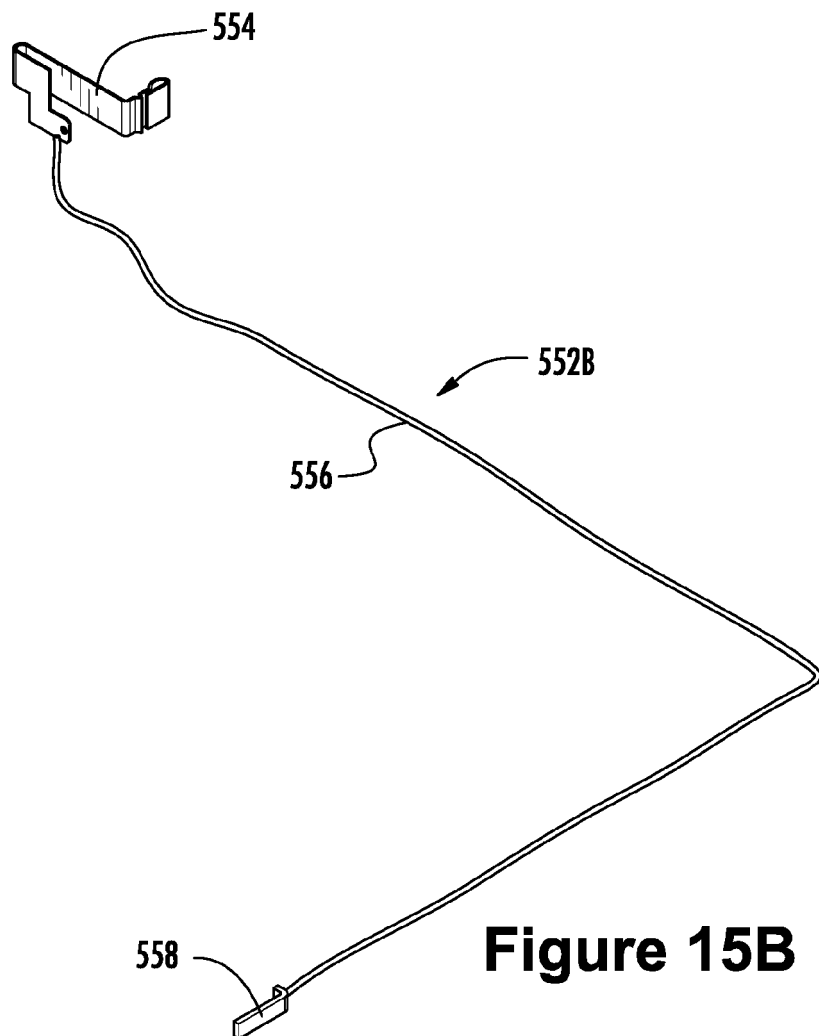


Figure 15B

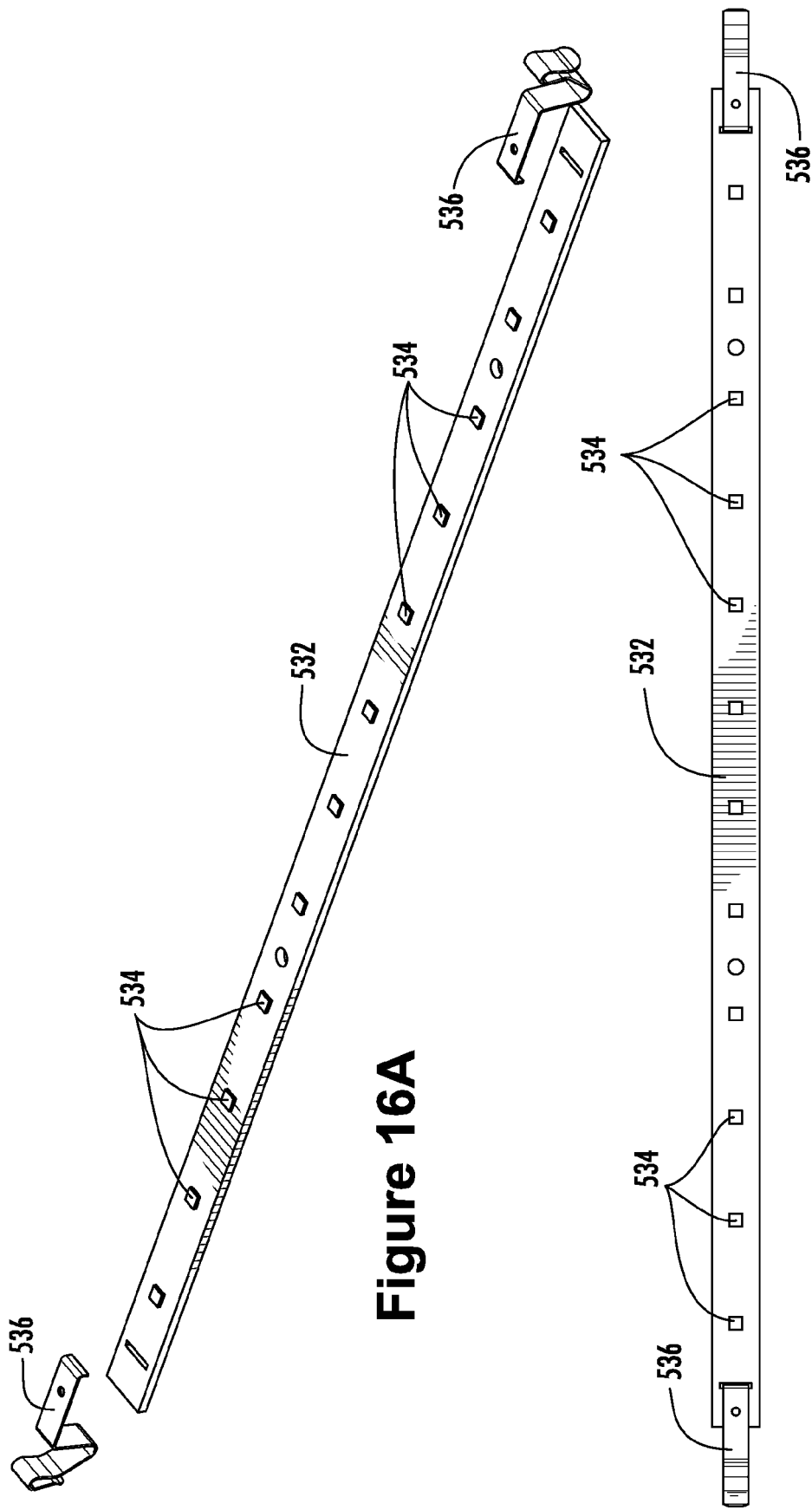


Figure 16A

Figure 16B

REFERENCES CITED IN THE DESCRIPTION

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