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(54) **LED LIGHT FIXTURES HAVING PLUG-TOGETHER LIGHT FIXTURE MODULES**

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CPC ***F21V 21/005*** (2013.01); ***F21K 9/272*** (2016.08); ***F21K 9/278*** (2016.08); ***F21V 23/06*** (2013.01);
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CPC F21S 4/28; F21Y 2103/10; F21K 9/27; F21K 9/272
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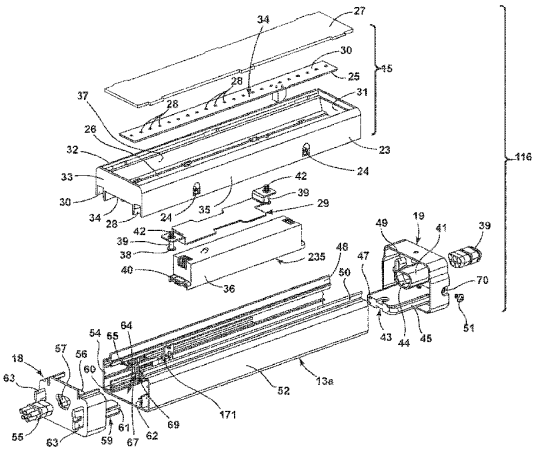
(57) **ABSTRACT**

An LED light fixture having adjacent interconnected light fixture modules, each comprising a power system extrusion, an LED light module body attachable to the power system extrusion, female and male end caps at opposite ends of each extrusion and respectively including a female electrical connector and a male electrical connector, a male electrical connector being configured to plug into the female electrical connector of an adjacent extrusion, and a power box component having a female electrical connector configured to plug into a male electrical connector of a male end cap.

18 Claims, 13 Drawing Sheets



(51) **Int. Cl.**

F21K 9/272	(2016.01)
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F21V 23/06	(2006.01)
F21V 29/508	(2015.01)
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F21Y 115/10	(2016.01)

(52) **U.S. Cl.**
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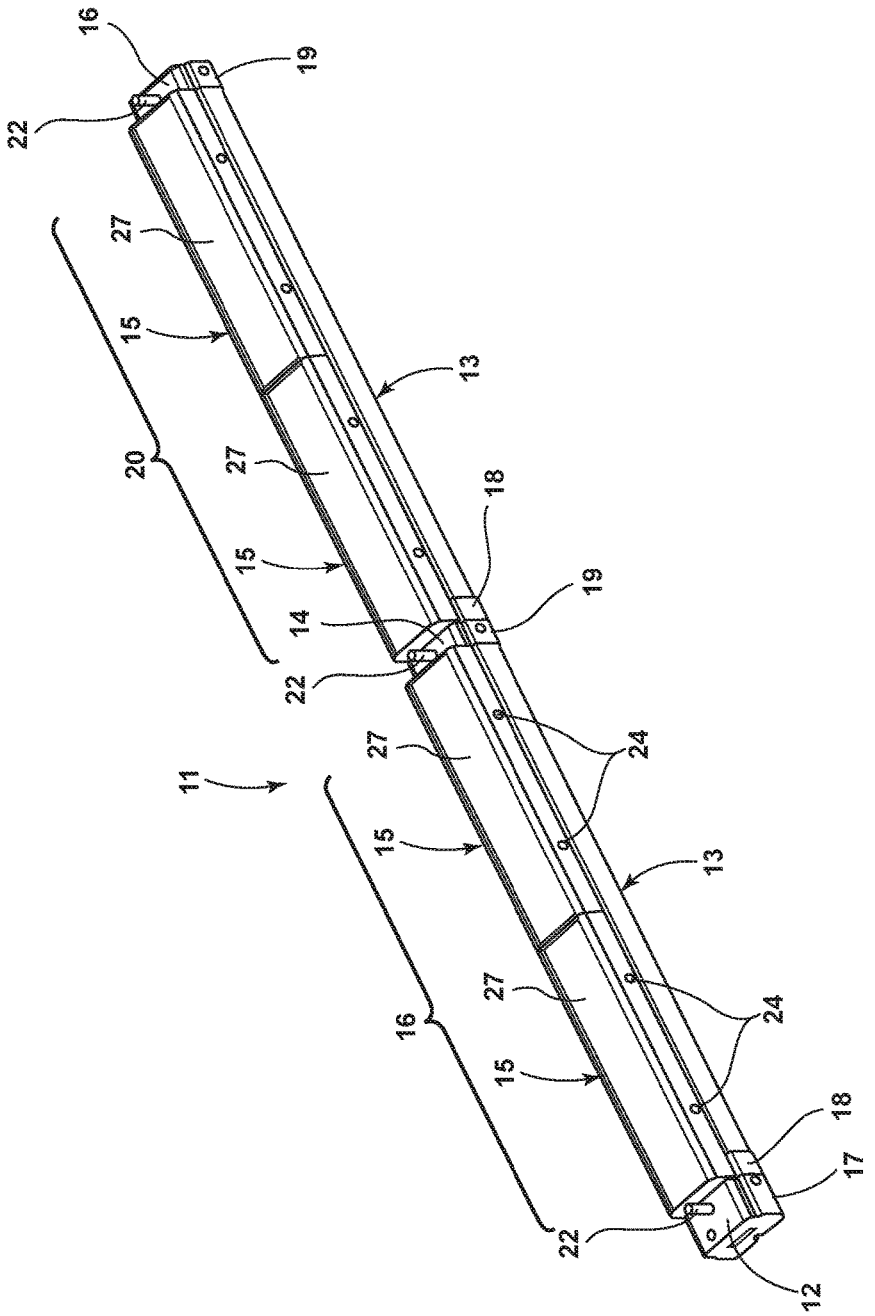
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FIG. 1

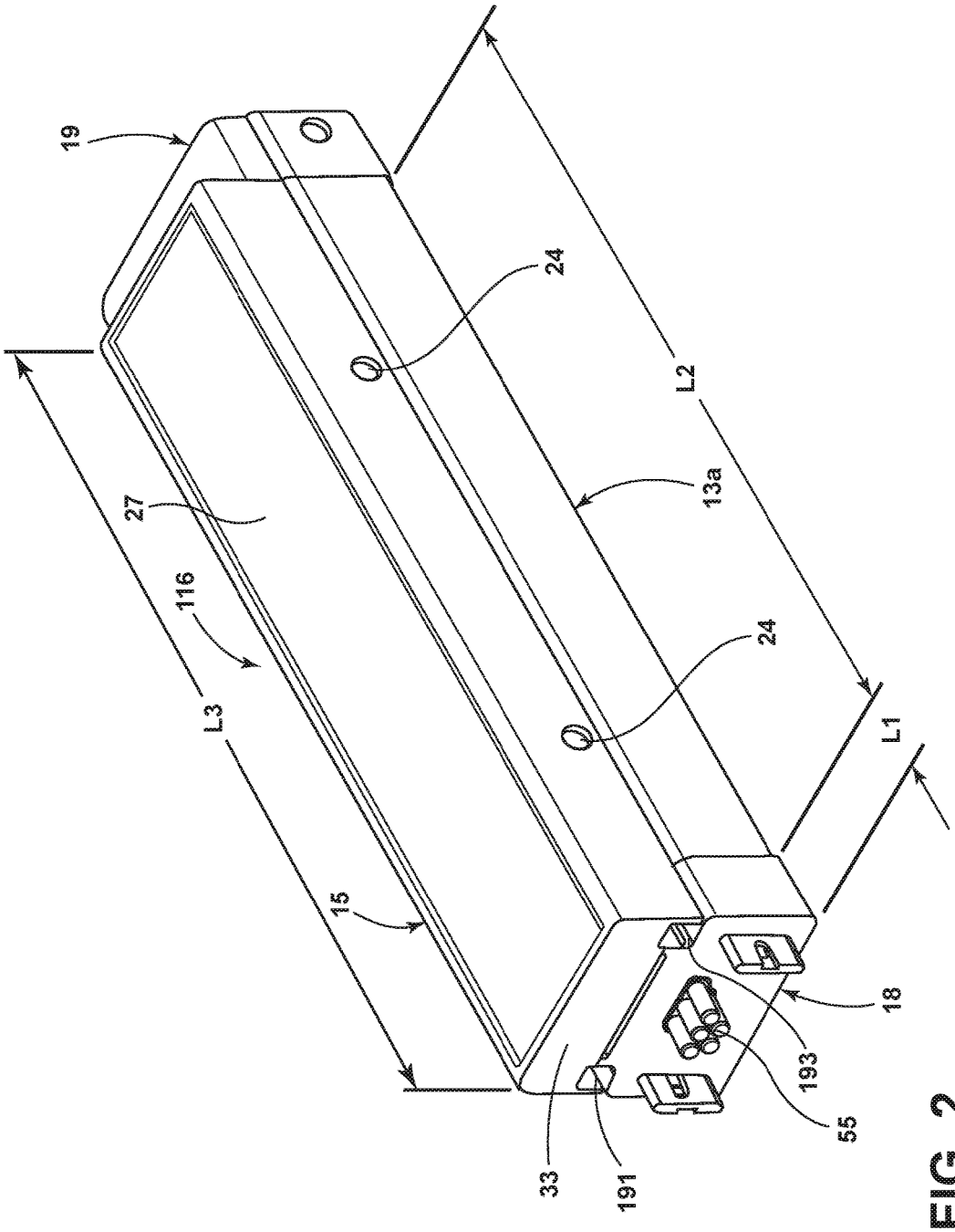

FIG. 2

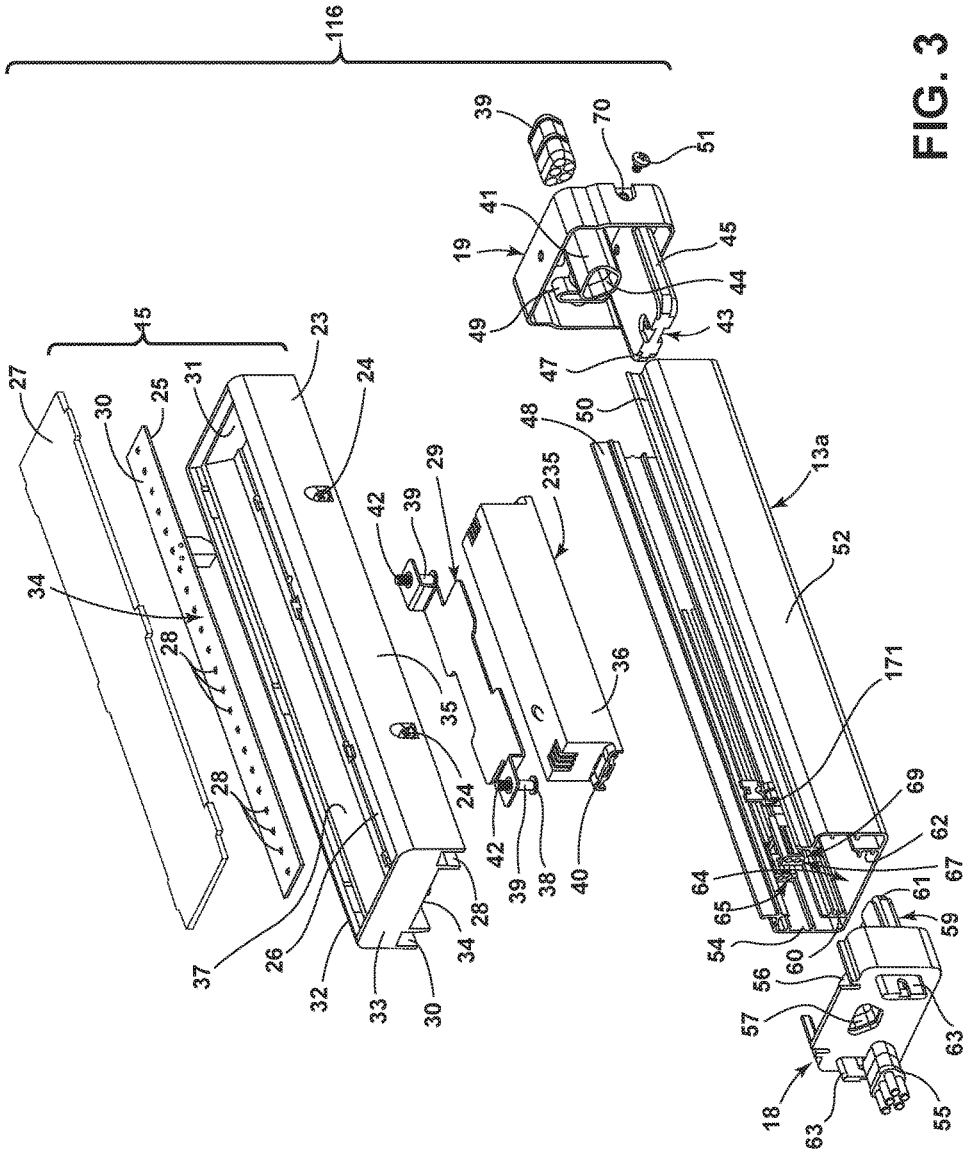
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FIG. 3

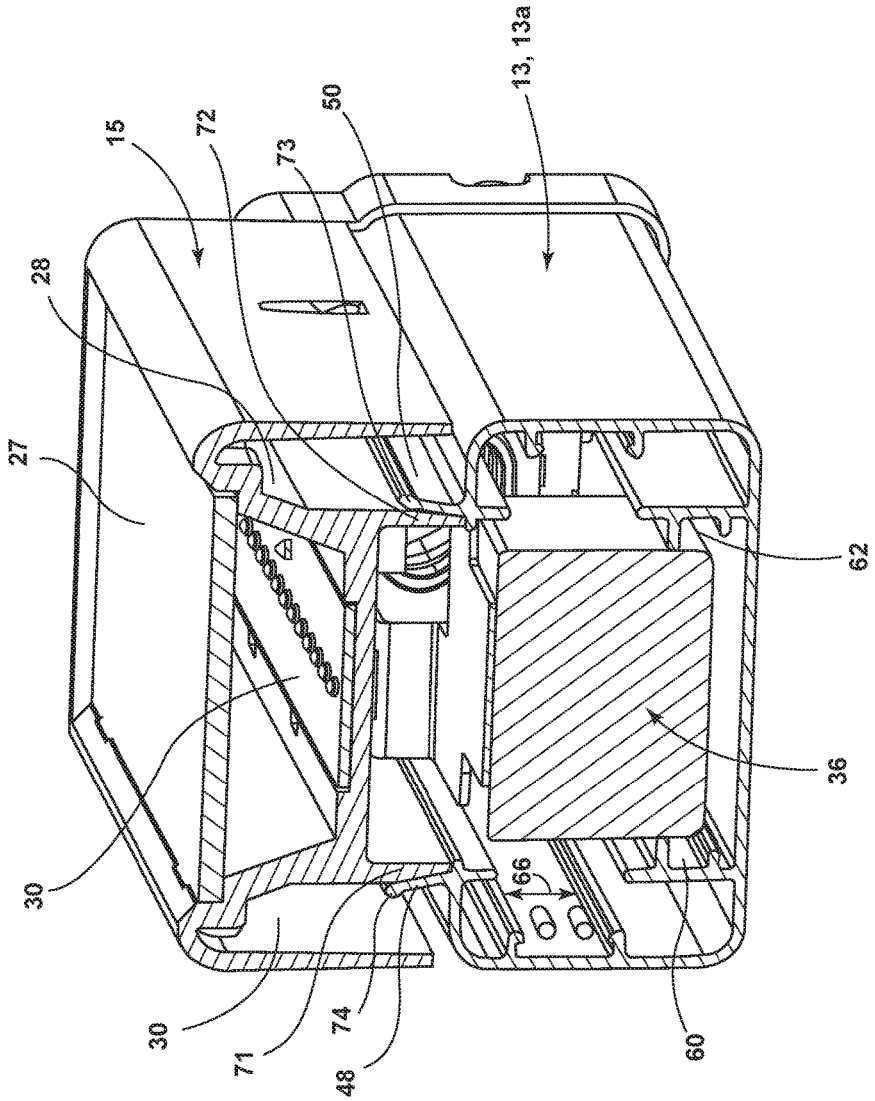
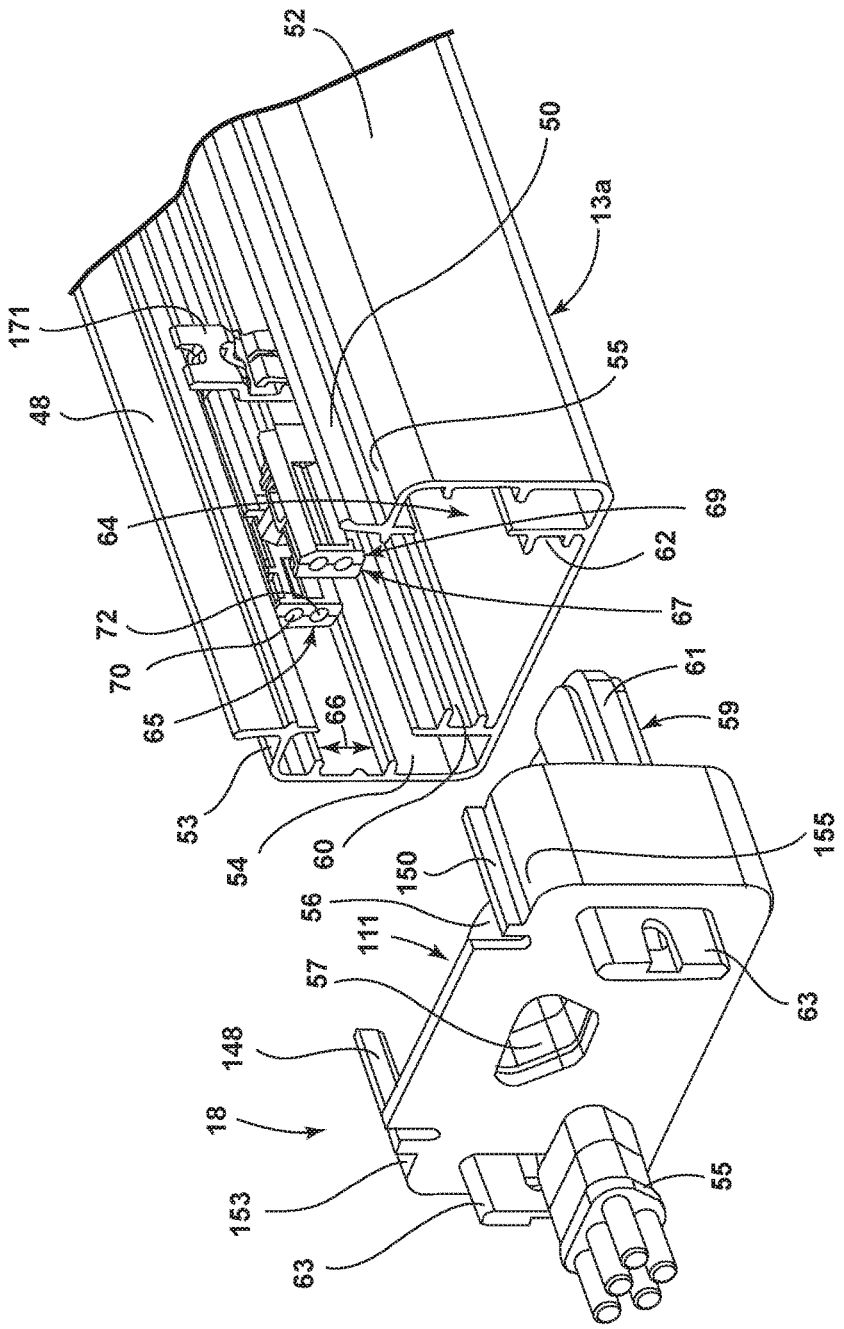


FIG. 4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148
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FIG. 5

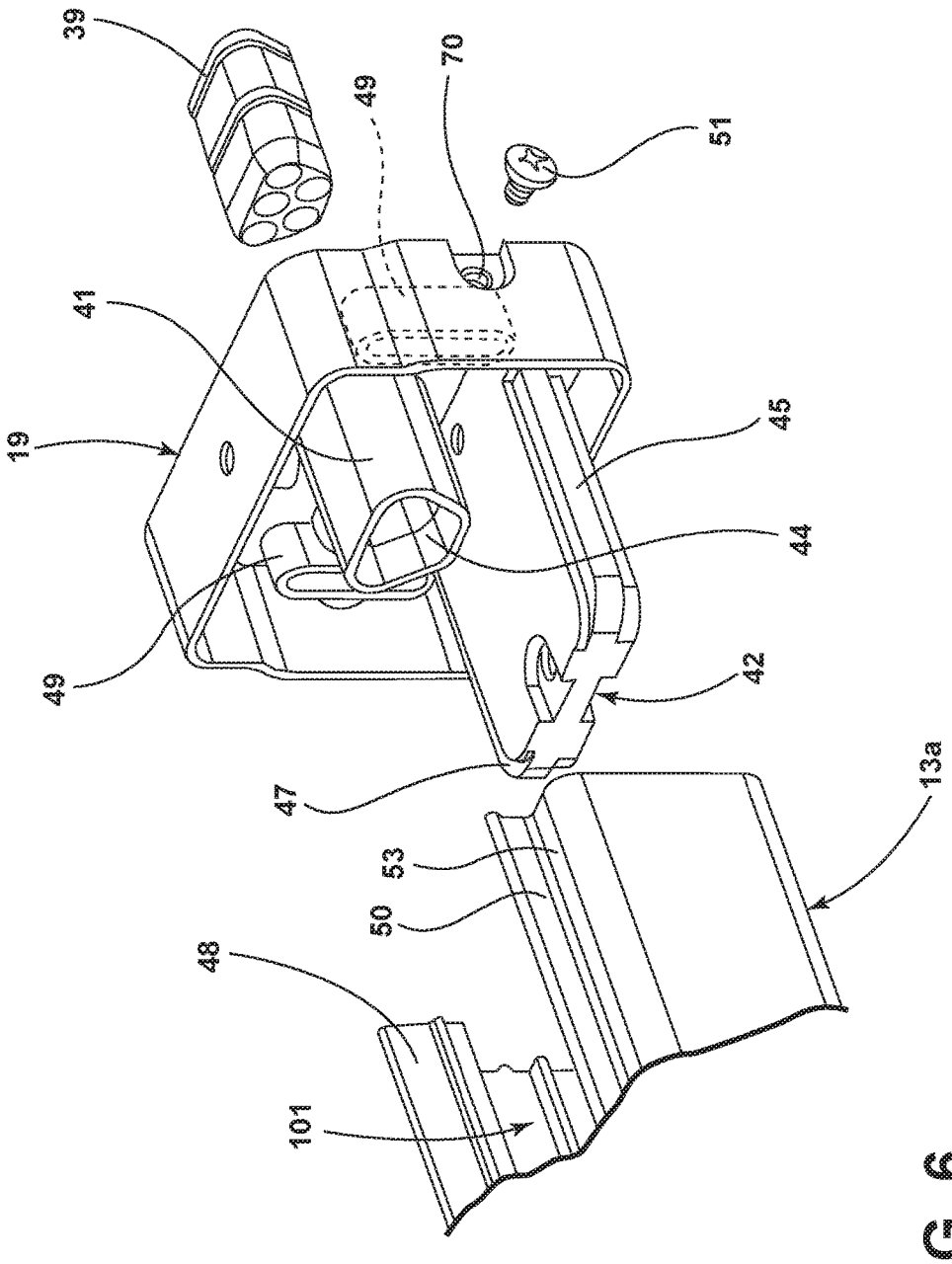

FIG. 6

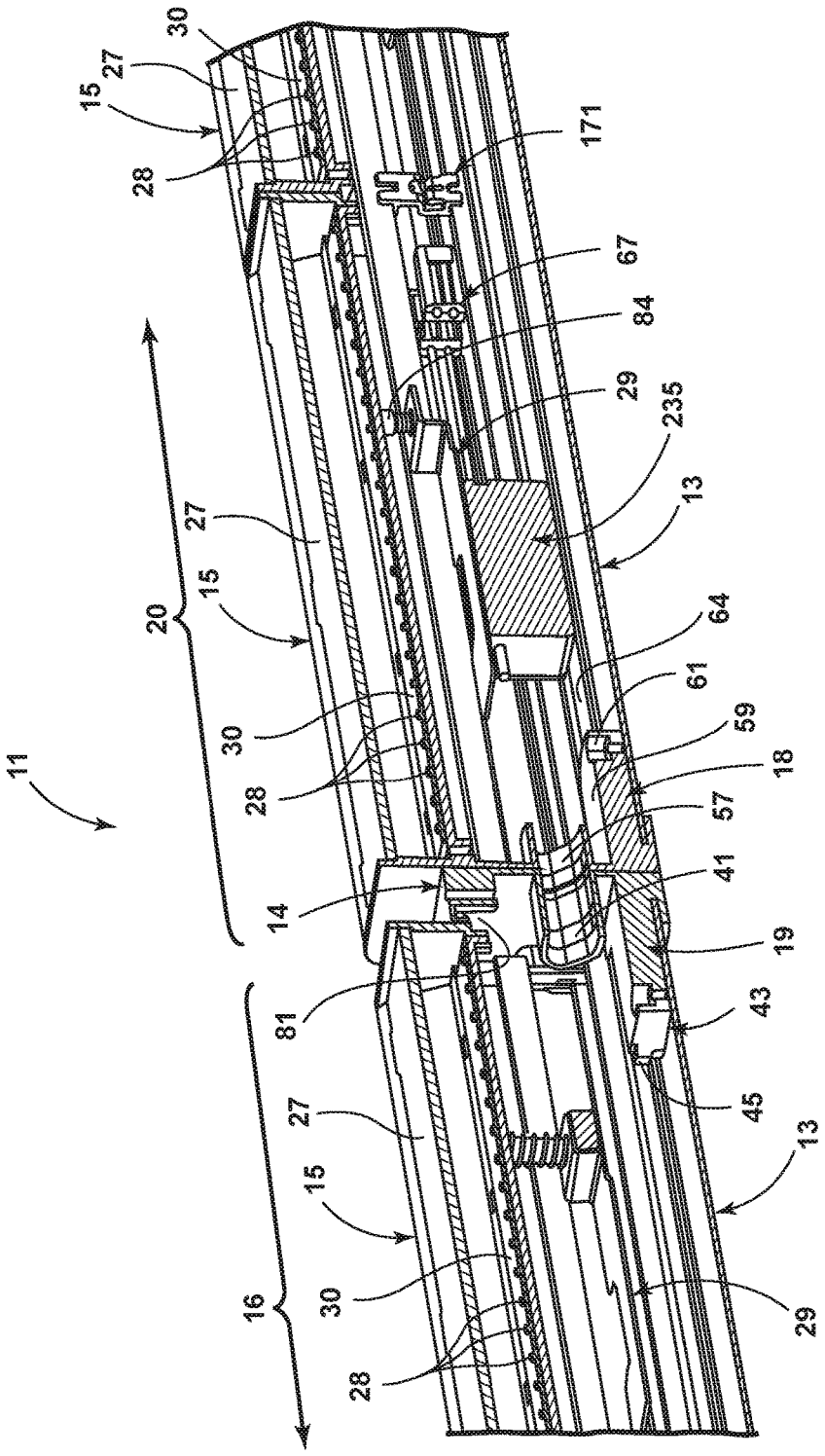
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FIG. 7

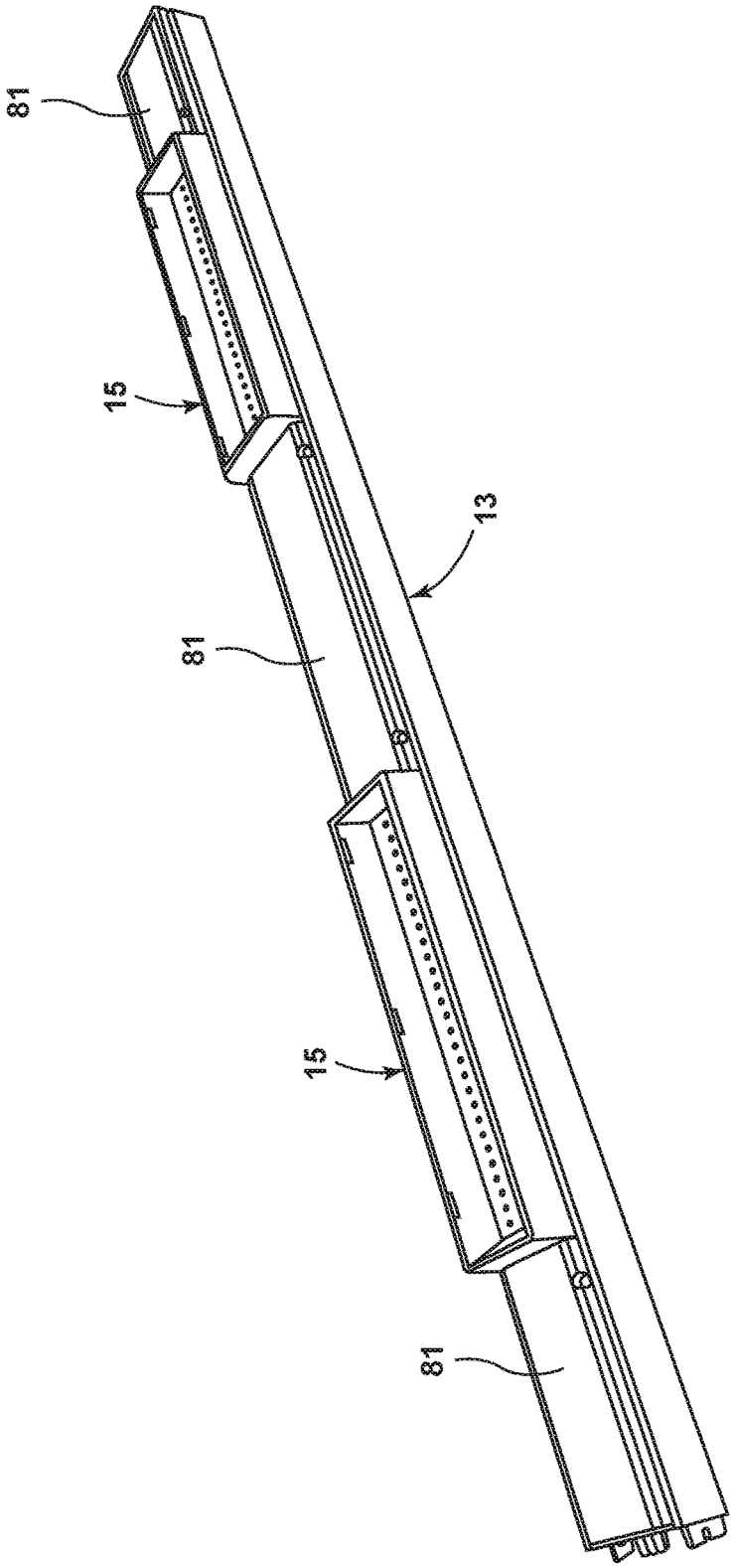


FIG. 8

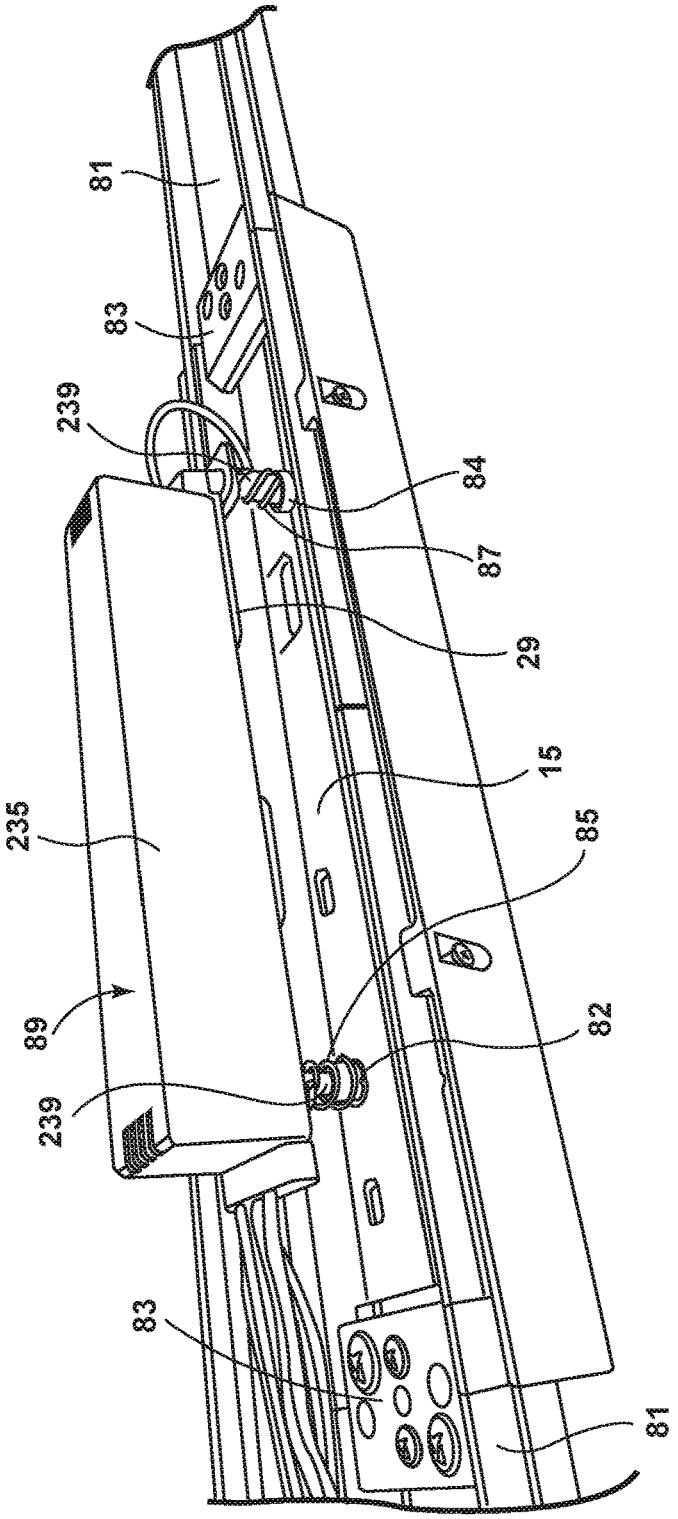


FIG. 9

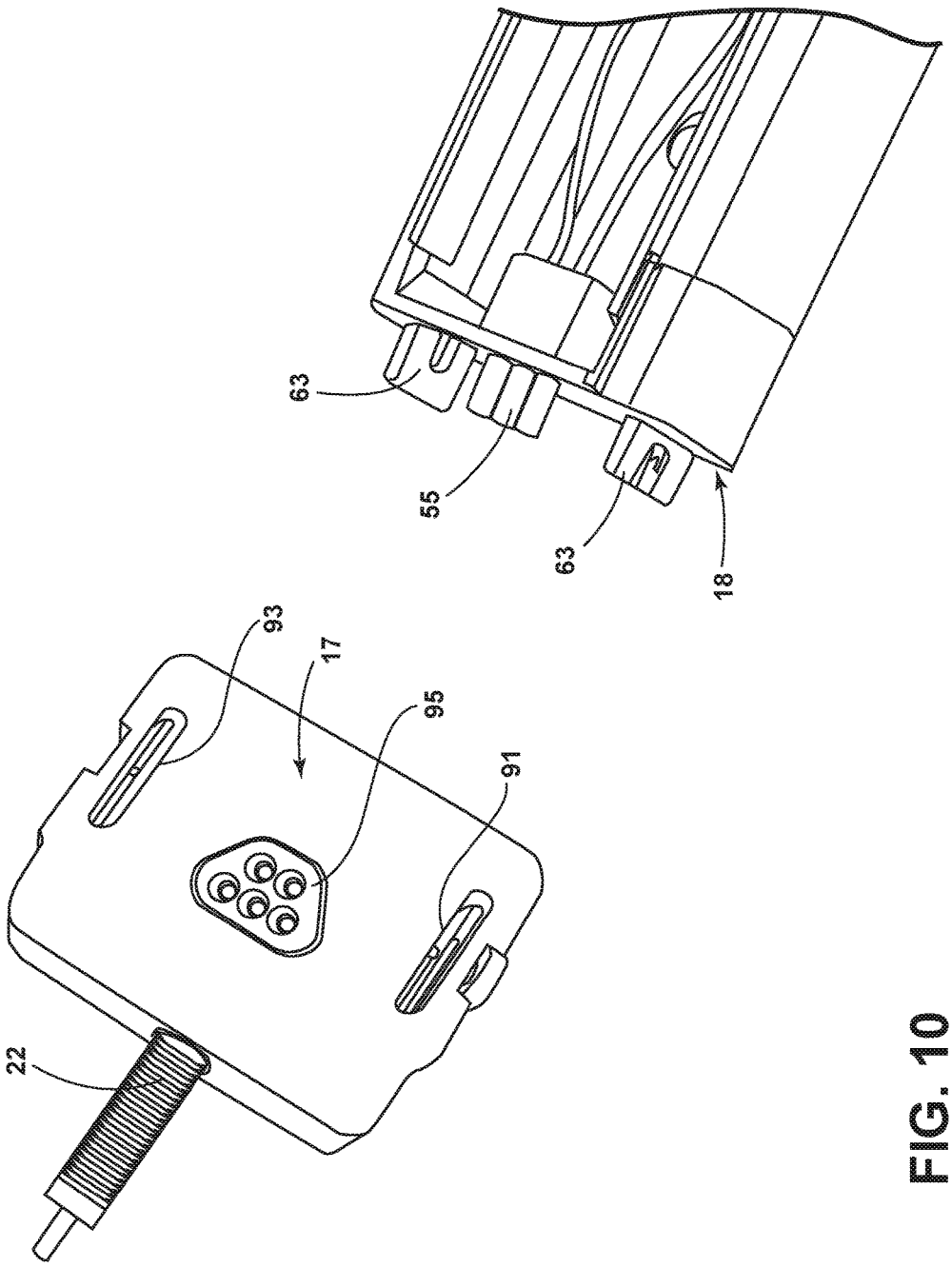


FIG. 10

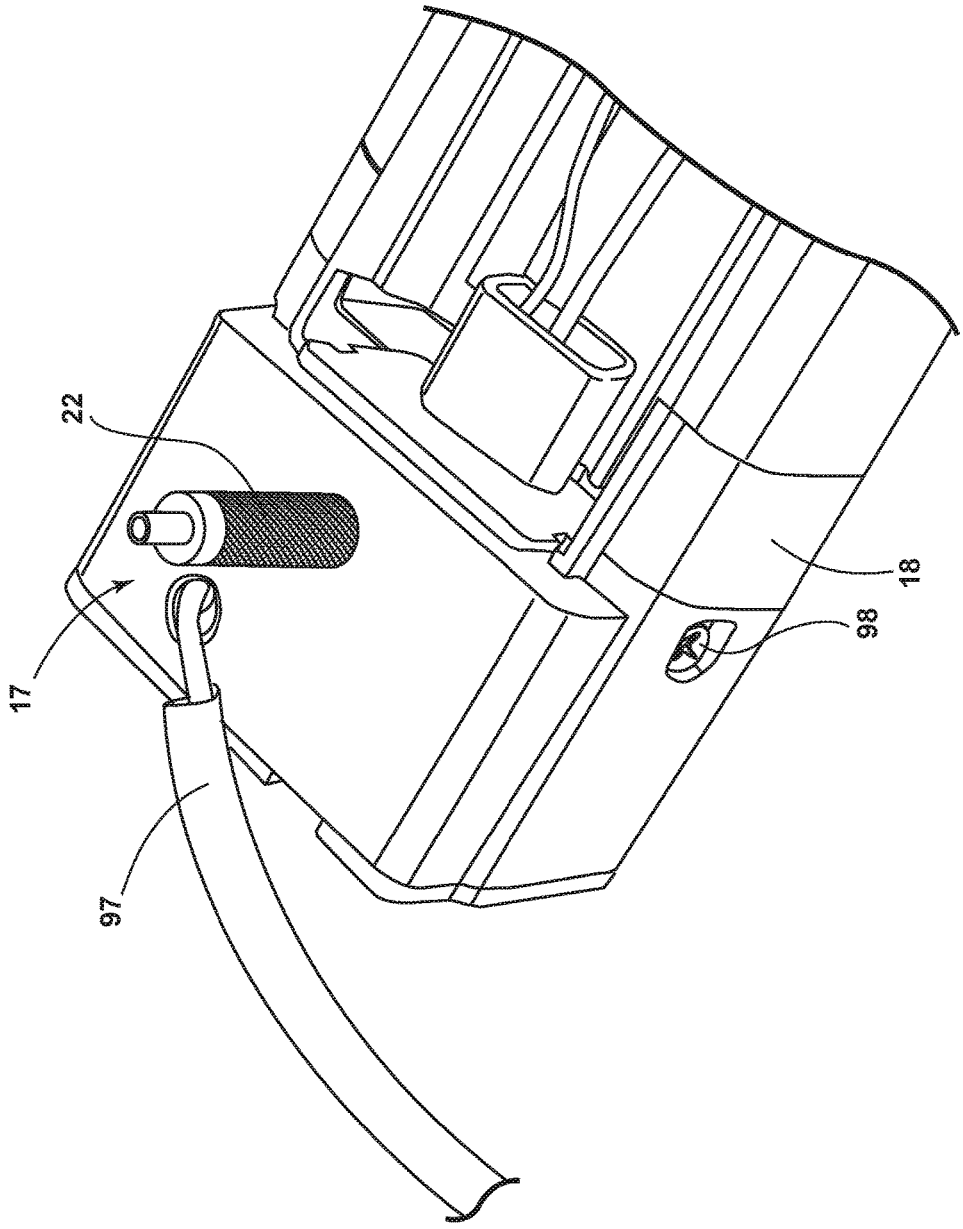


FIG. 11

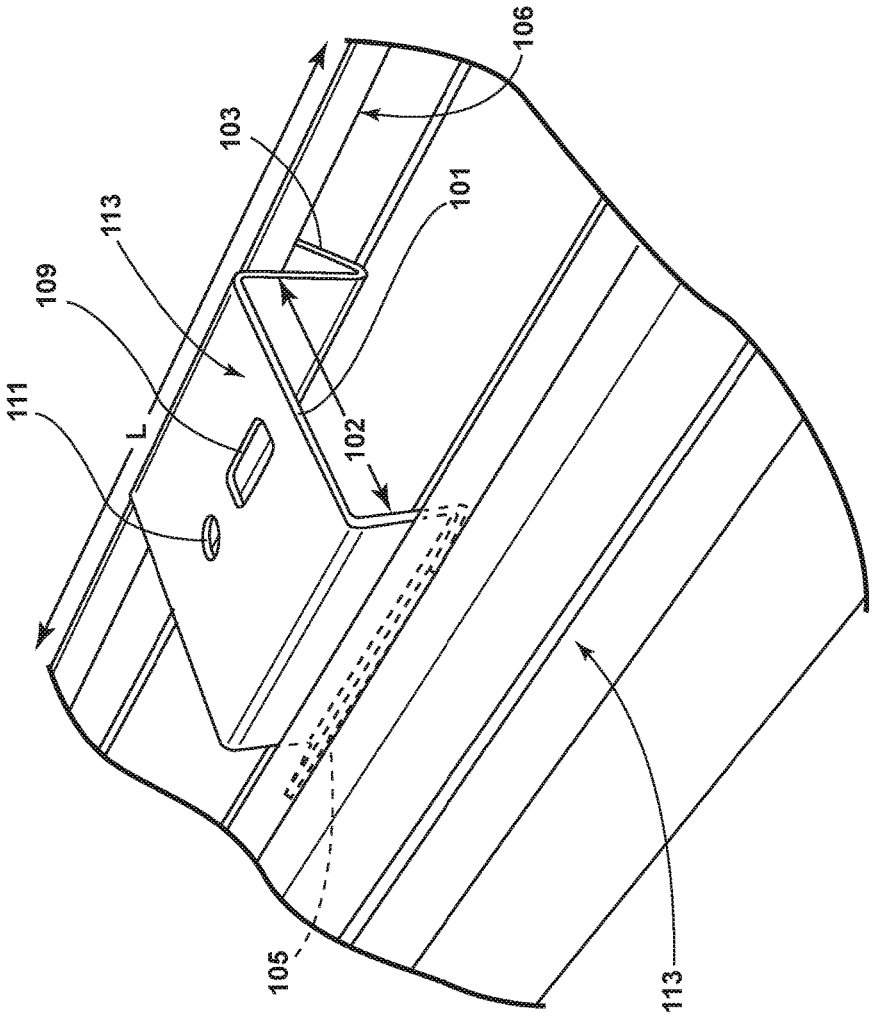
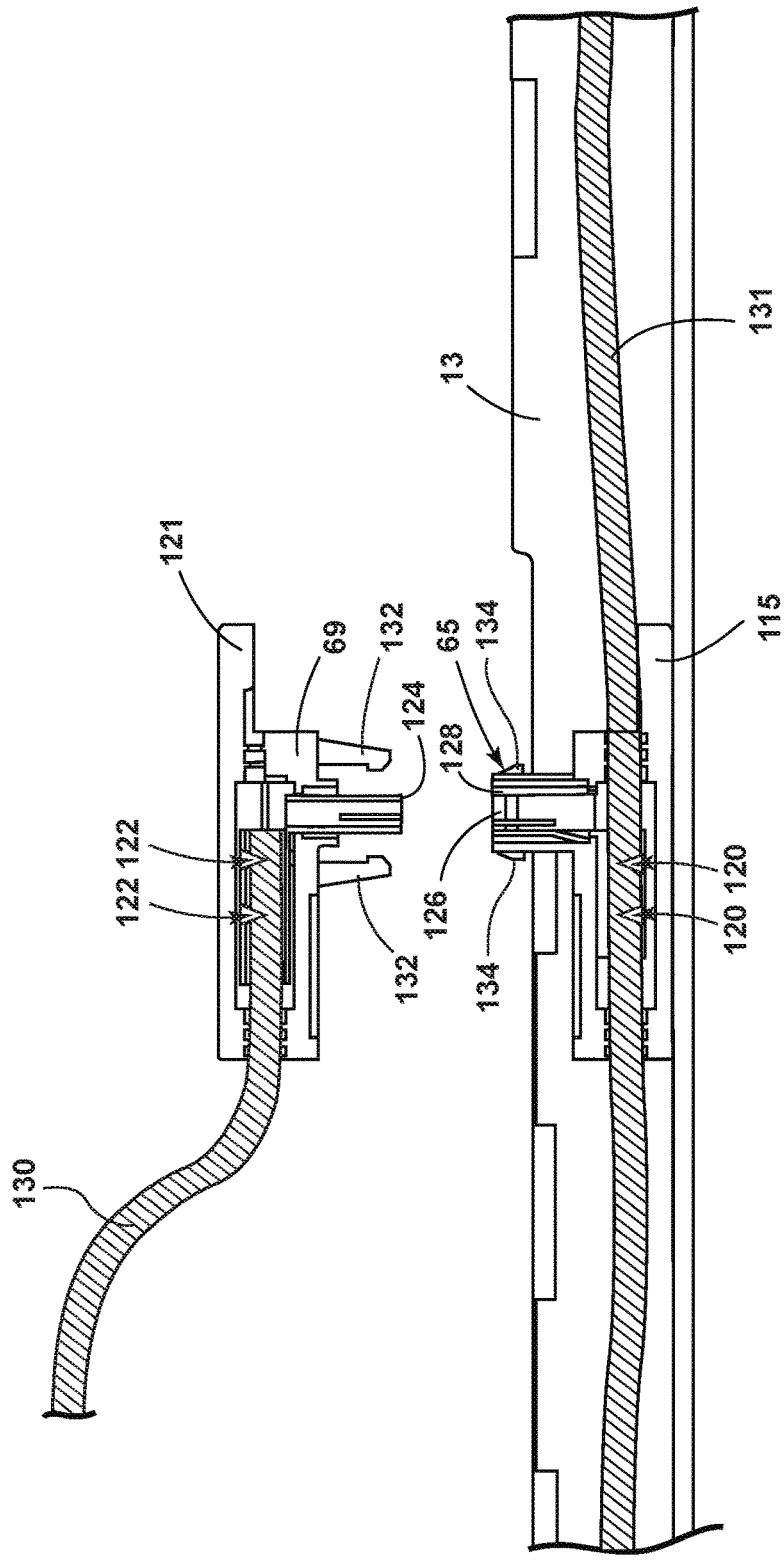


FIG. 12


131
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122 122
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120 120
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FIG. 13

LED LIGHT FIXTURES HAVING PLUG-TOGETHER LIGHT FIXTURE MODULES

FIELD OF THE DISCLOSURE

The subject disclosure relates to LED electric lighting fixtures, and more particularly to LED light fixture apparatus having adjacent light fixture modules which plug into one another and which feature flexible positioning of individual LED light modules along the length of a light fixture module, as well as flexible orientation of illumination direction in either an upward indirect mode or a downward direct mode.

DESCRIPTION OF RELATED ART

Various LED electric light fixtures have been constructed in the past, for example, such as those disclosed in U.S. Pat. Nos. 7,726,840 and 8,864,347, both assigned to Tempo Industries, LLC.

SUMMARY OF THE DISCLOSURE

According to an illustrative embodiment, an LED light fixture module may comprise one or more LED modules mounted to a power system extrusion. An interior floor of the power system extrusion has opposing horizontally facing channels formed therein, while an interior sidewall of the extrusion has a horizontally running channel which mounts an electrical connector configured to transfer power from electrical cables running through the extrusion to an LED driver mounted within a chamber defined within the LED module-power system extrusion assembly.

A female end cap is shaped to close a first end of the chamber and has a horizontally extending tongue, which is shaped and dimensioned to enable the horizontally extending tongue to slide into the horizontally facing channels on the floor of the power system extrusion. The female end cap further carries a centrally positioned female electrical connector and has respective slots formed in a front face thereof.

A male end cap is also provided which has a horizontally extending tongue which is shaped and dimensioned to enable the horizontally extending tongue to slide into the horizontally facing channels. The male end cap further has a centrally positioned male electrical connector configured to mate with the female electrical connector of a female end cap, as well as first and second tongues projecting from a vertical front face thereof, which are shaped to mate with the first and second slots of a female end cap.

A power box component is further provided having respective slots positioned to mate with the respective tongues projecting from the front face of the male end cap and a female electrical connector configured to mate with the male electrical connector of the male end cap. The power box component also has an electrical cable extending through a surface thereof and configured to attach to a source of electrical power external to the fixture, for example, such as a junction box.

In one embodiment, an LED driver module is located within the chamber defined by the LED module and power system extrusion and is attached to a spring biased mounting bracket which presses a surface of the driver module against an interior floor of the power system extrusion so as to improve heat transfer between the driver and the extrusion.

DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of an LED light fixture according to a first illustrative embodiment;

FIG. **2** is an exploded perspective view of an LED light fixture according to a second illustrative embodiment;

FIG. **3** is an exploded perspective view of the embodiment of FIG. **2**;

FIG. **4** is a cross-sectional view of an illustrative embodiment;

FIG. **5** is an enlarged perspective view of a first portion of the embodiment of FIG. **3**;

FIG. **6** is an enlarged perspective view of a second portion of the embodiment of FIG. **3**;

FIG. **7** is a fragmentary longitudinal cross-sectional view further illustrating the embodiment of FIG. **1**;

FIG. **8** is perspective view of an LED light fixture according to a third illustrative embodiment;

FIG. **9** is a fragmentary perspective view illustrating LED driver mounting apparatus according to an illustrative embodiment;

FIG. **10** is a perspective view illustrating a power box component of an illustrative embodiment;

FIG. **11** is a perspective view further illustrating the power box of FIG. **10**;

FIG. **12** is a fragmentary perspective view illustrating a hangar clip according to one embodiment; and

FIG. **13** is a side sectional view of an illustrative electrical connector according to one embodiment.

DETAILED DESCRIPTION OF ILLUSTRATIVE EMBODIMENTS

One illustrative embodiment of an LED light fixture **11** according to the illustrative embodiments is shown in FIG. **1**. The illustrative fixture **11** includes a pair of light fixture modules **16**, **20**. Each light fixture module **16**, **20** includes a male end cap slip fitter component **18**, a female end cap slip fitter component **19** a power system extrusion **13** and one or more LED light modules **15**. Two LED light modules **15** per power system extrusion **13** are shown in the particular embodiment of FIG. **1**, but the number may differ in different embodiments, for example, comprising as many as eight or more LED light modules **15** per power system extrusion **13** in some embodiments. In one embodiment, the power system extrusion **13** may be extruded aluminum and the LED modules **15** may comprise a module body or housing formed of die cast aluminum, for example A380 alloy aluminum. The extrusion **13** and modules **15** may of course be made of other materials in other embodiments. In one embodiment, each of the power system extrusions **13** may be of the same length, for example, four feet, but may be of differing lengths in other embodiments.

In the illustrative embodiment, each LED light module **15** directs LED-generated light through a respective lens **27**. As known in the art, in various embodiments lenses may be used to tailor the light output pattern of the LED's in a desired manner. In various embodiments, lenses may also protect the LEDs and/or assist in sealing the modules **15**.

In the illustrative embodiment, each LED module **15** is attached to a power system extrusion **13** by respective screws, e.g. **24**. Thus, each light module **24** may be removed for repair or replacement without disassembling the rest of the fixture **11**. In other embodiments, the LED light modules **15** may be attached to the power system extrusion **13** in other manners.

In the embodiment shown in FIG. **1**, at a first end of the fixture **11**, a power box **17** interconnects with a first male end cap slip fitter component **18**, which in turn interconnects with the first power system extrusion **13**. The first and second power system extrusions **13** are interconnected by

Jesco Lighting Group, LLC -- EX1013 - Page 16 of 21
Jesco Lighting Group LLC v. AGS Lighting Management LLC -- IPR2025-01328

mating engagement between a first female end cap slip fitter component **19** and a second male end cap slip fitter component **18**. A second female end cap slip fitter component **19** interconnects with the second power system extrusion **13** at the second or opposite end of the fixture **11**.

In the illustrative embodiment, the power box **17** and each of the first and second female slip fitter components **19** has a cable gripper **22** projecting vertically from a respective top surface **12**, **14**, **16** thereof, which facilitates attachment of cables or other mechanisms to suspend the fixture **11**, for example, from a ceiling, electrical junction box, and/or T-bar structure. Thus, the embodiment of FIG. **1** may be characterized as a pendant version, where light is directed upwardly through the lenses **27** so as to create an indirect lighting effect.

FIG. **2** shows another illustrative embodiment of a light fixture module **116** employing a single LED light module **15** mounted to a power system extrusion **13***a*. In an illustrative embodiment, the LED light module **15** may be one foot in overall length. Other lengths could of course be used in other embodiments.

The power system extrusion **13***a* is closed at one end by a male end cap slip fitter component **18**, which has a five pin male connector. At the other end, the extrusion **13***a* is closed by a female end cap slip fitter component **19**, which has a five receptacle female connector **39** (FIG. **3**) configured to mate with a connector such as 5 pin male connector **55**.

FIG. **3** shows an exploded view of the illustrative light fixture embodiment of FIG. **2**. As shown, the LED light module **116** includes an LED light module **15** having a module body **23**, a lens **27**, an LED circuit board **25** mounting one or more LEDs or LED devices, e.g. **28**, on a top surface **30** thereof. In the illustrative embodiment, the module body **23** has a rectangular perimeter defined by respective parallel vertical end walls **31**, **33**, and respective parallel vertical sidewalls **35**, **37**.

In one embodiment, the lens **27** is a generally rectangular, flat, frosted lens. In the illustrative embodiment, the LED circuit board **25** is attached to a floor **26** of the module body **23** and is recessed a selected distance from the top edge **32** of the module body **23**, thereby providing a selected cut-off of the illumination provided by the LEDs **28**. Respective channels **28**, **30** are formed at respective lower sides of the module body **23**.

An LED driver module **235** for powering the LEDs **28** attaches to a driver mounting bracket **29**, which in turn is attached to a bottom surface **34** of the module body **23** by respective screws **42**, which in one embodiment may thread into respective bosses formed on the bottom surface **34**. In one embodiment, the driver module **235** comprises a driver case base **40** and a driver base cover **36**.

The power system extrusion **13***a* has a hollow interior located between respective vertical side surfaces **52**, **54**. As shown in FIG. **5**, each side surface **52**, **54**, curves into a respective horizontal top surface segment **53**, **55**, from which extend respective horizontally running upwardly extending wing surfaces **48**, **50**, which run the length of the power system extrusion **13***a* and define a generally rectangular opening **101** between them as shown in FIG. **6**. In the illustrative embodiment, each of the wings **48**, **50** is angled outwardly slightly from the vertical. The power system extrusion **13** of FIG. **1** may be constructed in the same or similar fashion to the power system extrusion **13***a*.

FIG. **4** illustrates how the LED light module **15** is attached to a power system extrusion **13** or **13***a* and is shaped so as to close the rectangular opening **101** in the extrusion **13**, **13***a*, so as to define a closed interior chamber in which the LED driver module **235** is located. In the illustrative embodiment, closure is achieved via abutment or engagement between the outer side surfaces of the inner walls **71**,**72** of the channels **28**, **30** formed in the LED module **15** and the respective inner side surfaces of each respective wing **48**, **50**.

In one embodiment, respective self-threading screws **24** as shown in FIG. **3** are angled and screwed into the power system extrusion **13**, **13***a* in order to fasten each LED module **15** to the power system extrusion **13**, **13***a* in manner which provides contact between the components **15** and **13** or **13***a* which is tight enough to increase heat transfer between the components **15** and **13** or **13***a* to optimize such transfer for thermal management purposes. In one embodiment, extended tips **73**, **74**, are provided on the wings **48**, **50** of the power system extrusion **13**, **13***a*. In such an embodiment, the tips **73**, **74**, extend above the ends of the mounting screws and are shaped and dimensioned such that, if the LED module **15** is properly mated and aligned with the power system extrusion **13** or **13***a*, the screws **24** will bite in and pull the units, e.g. **15** and **13***a*, more tightly together, whereas, if the units are misaligned the screws will not bite and hold at all.

As further shown in FIGS. **3** and **5**, an electrical connector **67** having respective connector halves **65**, **69** is mounted on one interior sidewall **54** of the power system extrusion **13***a*. In one embodiment, the electrical connector **67** is shaped and dimensioned to snap fit into a channel **66** formed in the interior sidewall **54**.

As illustrated in FIG. **13**, in one embodiment, a male electrical connector **124** electrically connected to insulation piercing pins **122** is configured to plug into an opening **126** in a female receptacle **128** electrically connected to insulation piercing pins **120** to establish electrical continuity between electrical leads **131** and the leads **130** which supply power to the LED power supply or driver **235**. In one embodiment, a snap fit mechanism comprising flexible tabs **132** configured to engage projections **134** may be provided to secure components **65** and **69** together. The illustrative embodiment of FIGS. **3** and **13** enables ease of electrical connection and disconnection during manufacturing and repair or replacement of the LED driver **235**.

In one embodiment, respective line voltage leads **131** (e.g. 120 volts A.C.) pass through the connector half **65** and are pierced to tap power off to the inputs of the LED driver **235** via respective leads **130** of the second connector half **69**, as illustrated in FIG. **13**. The wire management clip **171** in FIG. **3** serves to assist in guiding the line voltage leads **131** to the connector **65**. In one embodiment, the clip **171** also is shaped and dimensioned to snap into the channel **66** of the power system extrusion, e.g. **13**.

As shown in FIGS. **3** and **5**, the inside surface of the illustrative male end cap slip fitter component **18** has an inwardly extending horizontal tongue **59** with lips **61** formed on opposite sides thereof and shaped and dimensioned to enable the tongue **59** to penetrate and slide into the respective horizontally facing u-shaped channels **60**, **62**, which run the length of the power system extrusion **13***a*. The outer vertical surface of male slip fitter component **18** has a receptacle **56** with an opening **57** shaped to receive the 5 pin male connector **55**. Respective tongues **63** are formed on opposite sides of the vertical front face of the male end cap slip fitter **18**.

As shown in FIG. **5**, the male end cap slip fitter **18** further has respective horizontal top surface segments **153**, **155**, from which extend respective horizontally running upwardly extending wing surfaces **148**, **150**, which run the length of the top surface segments **153**, **155** and define a

generally rectangular opening **111** between them. In the illustrative embodiment, each of the wings **148**, **150** is angled outwardly slightly from the vertical and is shaped and positioned so as to abut the horizontally running wings **48**, **50** (FIG. **4**) of the power system extrusion and to contact the interior side surfaces **71**, **72** (FIG. **4**) of the LED module **15**. As seen in FIG. **2**, in an illustrative embodiment, the length L**1** of the male end cap slip fitter component **1** plus the length L**2** of the power system extrusion **13***a* is equal to the overall length L**3** of the LED module **15** such that the vertical front face of the male end cap **18** and the vertical end wall **33** of the LED module **15** flushly align with one another.

As shown in FIGS. **3** and **6**, the female end cap slip fitter **19** is shaped to close one end of the chamber between the LED module **15** and the power system extrusion **13** and has an inwardly extending horizontal tongue with lips **45**, **47** formed on opposite sides thereof. The lips **45**, **47** are also shaped and dimensioned to slide and engage with the respective channels **60**, **62** of the power system extrusion **13***a*. A receptacle **41** formed in the female slip fitter **37** has an opening **44**, which receives the 5 pin female connector insert **39**. Respective slots **49** are formed in the front face of the female slip fitter **19** and are shaped and dimensioned to receive the respective tongues **63** projecting from the front of a male slip fitter component **18**. In various embodiments, the slots **49** and tongues **63** mate, for example, in order to join the first and second power system extrusions **13** of FIG. **1**. In one embodiment, screws, e.g. **51** (FIG. **3**) may thread into suitable openings, e.g., **70** to lock the tongues **63** in place in the slots **49**. It will be appreciated from the above discussion that in FIG. **1**, for example, the first light fixture module **16** simply plugs in to the second light fixture module **20**.

In one embodiment, the male and female connectors **55**, **39** are shaped and dimensioned to mate with each other and to snap into place in the respective openings **57**, **44**, but could be held in place by other mechanisms in other embodiments, such as, for example, press-fit or adhesive bonding. In one embodiment, the trapezoidally-shaped five pin connectors may be formed of 5 VA rated plastic and provide line, neutral and ground interconnections, as well as two other interconnections, which enable provision of a second circuit to facilitate low voltage dimming or signal sensing in various embodiments.

FIG. **7** is a partial side sectional view illustrating further details of the embodiment of FIG. **1** in an assembled state. As may be seen, tongues **43** and **59** of the female and male end slip fitter components **19**, **18** are inserted into the channels **60**, **62** to secure those components in position. The respective receptacles **41**, **57** carrying the five pin connectors **39**, **55** abut one another. The five pin connectors **39**, **55** themselves are omitted from FIG. **7** for illustrative purposes. The positioning and mounting of respective driver mounting plates **29** in each of the adjacent modules **16**, **20** is also illustrated. The driver **235** in the left most module **16** has also been omitted for illustrative purposes.

FIG. **8** illustrates another embodiment where the LED light modules **15** are spaced-apart by generally flat cover members **81**. FIG. g **9** illustrates the module and cover assembly inverted and shows splice components **83** used to attach together the cover members **81** and modules **15** in linear order.

FIG. **9** further illustrates an illustrative mounting mechanism for the LED driver module **235**. As may be seen, the LED mounting bracket screws **42** are threaded into respective bosses **82**, **84** on the underside of the LED module **15** and are spring loaded by respective springs **85**, **87**. Respective sleeves **239** position the driver module **235** a distance away from the LED module **15** selected to cause the springs to be in compression when the module **15** is assembled to the power system extrusion **13** so as to press the flat surface **89** of the driver module **235** into the flat bottom floor **64** of the power system extrusion **13** as shown in FIG. **7** to thereby enhance or improve heat transfer from the driver **235** to the power system extrusion **13** for thermal management purposes. The flat sheet metal bracket **29** permits driver modules of various lengths to be employed and varying widths of driver modules are accommodated by the flat bottom floor **64** of the power system extrusion **13**, **13***a*.

As FIGS. **10** and **11** further illustrate the power box **17** and its interface with a male slip fitter component. The power box **17** is generally rectangular in cross-section and has respective slots **91**, **93** shaped and dimensioned to mate with respective tabs **63** of a male end cap slip fitter component **18**. In one embodiment, the power box height is selected such that it covers openings **191**, **193** (FIG. **2**) between the male end cap slip fitter component **18** and the LED module **15**.

The power box **17** includes a five receptacle female connector **95** shaped and dimensioned to mate with the five pin male connector **55** of the male end cap slip fitter **18**. The five receptacle female connector **95** is supplied with power (e.g. 120 volts A.C.) via an electrical cable **97** which enters an opening in the top of the power box **17**, as shown in FIG. **11**. In assembly at the factory, the cable **97** is attached to the five pin female connector **95**, which is then snapped into the central receptacle in the body of the power box **17**. Thus, an electrician in the field does not have to go inside the fixture **11** to establish electrical connection to it, but rather may simply connect the cable **97** to a junction box and plug the power box **17** into the male end cap slip fitter **18**. As may be seen in FIG. **11**, in an illustrative embodiment, the power box **17** may be locked in place by a screw or other fastening device **98**.

In illustrative embodiments, a power box **17** may begin a run of interconnected LED modules, e. g. **16**, **20**. In illustrative embodiments, LED light modules **15** may be mounted anywhere along the length of a power system extrusion **13**, **13***a* but not covering the female end caps **19**. LED light modules **15** may also be removed for service or replacement without the need to disassemble the rest of the fixture.

FIG. **12** illustrates a snap-in mounting clip **101**, which is rectangular in cross-section **102** and has respective wings **103**, **105**, which snap into grooves **105**, **107** in a second illustrative embodiment of a power system extrusion **113**. Illustrative embodiments of the power extrusion **113** may be constructed as illustrated in FIG. **3**.

According to the embodiment of FIG. **12**, the clip **101** may slide along the length "L" of the extrusion **113** and may thus be positioned at any point along that length "L." The clip **101** has apertures **109**, **111** in its top surface **113**, which facilitate connection of various mechanisms, for example, such as chains or cables for suspending a light fixture comprising extrusion **113** from a ceiling or other surface. During installation of such a fixture, the clip **101** provides the advantage that it may be moved to a position directly beneath a suspension chain or cable so that the chain or cable is vertically oriented, rather than requiring it to be angled to accommodate a fixed-in-place interconnection mechanism. As will be appreciated, in illustrative embodiments according to FIG. **12**, light modules, e.g. **15**, are mounted on an underside of the extrusion **113** so as to direct illumination in a downward direct mode.

The plug together light fixture modules of illustrative embodiments have the advantage that wiring between the modules, e.g. **16**, **20** does not have to be disconnected and then re-connected to disassemble modules for service or other reasons or to initially assemble modules, thus avoiding the necessity to match one wire to another (e.g., "blue wire" to "red wire") or to insert individual wires into interconnecting devices, for example, such as wire nuts. Thus, a great savings in labor costs, as well as increased connection simplicity and reliability is achieved.

From the foregoing, those skilled in the art will appreciate that various adaptations and modifications of the just described illustrative embodiments can be configured without departing from the scope and spirit of the invention. Therefore, it is to be understood that, within the scope of the appended claims, the invention may be practiced other than as specifically described herein.

What is claimed is:

1. An LED light fixture apparatus comprising:

a power system extrusion formed of heat conductive material and having an opening defined between first and second surfaces thereof, the power system extrusion further having a channel formed in an interior thereof, the channel being configured to receive a power system extrusion electrical connector, the power system extrusion further having first and second horizontally facing channels formed in said interior,

an LED light module attachable to said power system extrusion and shaped so as to close said opening so as to define a chamber within the power system extrusion and the LED light module, the LED light module having a surface mounting a circuit board carrying at least one LED;

a female end cap shaped to close a first end of said chamber, the female end cap having a horizontally extending tongue shaped and dimensioned to slidably mate with said first and second horizontally facing channels, said female end cap having an opening located in a vertical face thereof shaped to receive a first female electrical connector and first and second slots formed in said vertical face;

a male end cap having a horizontally extending tongue shaped and dimensioned to slidably mate with said first and second horizontally facing channels, said male end cap further having an opening located in a vertical face thereof shaped to receive a first male electrical connector and first and second tongues projecting from the vertical face and shaped to mate with said first and second slots of said female end cap; and

a power box component having respective slots positioned to mate with the respective tongues of said male end cap and having a second female electrical connector positioned to mate with the first male electrical connector, the power box component having an electrical cable extending through a surface thereof and configured to be attached to a source of electrical power external to said LED light fixture.

2. The LED light fixture of claim **1** wherein said first male electrical connector comprises a five pin electrical connector and wherein said first female electrical connector comprises a five receptacle electrical connector wherein each of the five receptacles is configured to mate with a respective one of the five pins.

3. The LED light fixture of claim **2** wherein each of the first male and first female electrical connectors have a trapezoidal cross-section.

4. The LED light fixture of claim **1** further comprising an LED driver module located within said chamber and a mounting bracket configured to mount to an under surface of said LED light module, the mounting bracket being spring biased so as to press a surface of the LED driver module against the interior of said power system extrusion when the LED light module and extrusion are attached together so as to improve heat transfer from the driver module to the power system extrusion.

5. The LED light fixture of claim **4** wherein said LED driver module is configured to receive an AC input voltage and output a DC voltage.

6. The LED light fixture of claim **5** wherein said AC input voltage is a line input voltage.

7. An LED light fixture comprising:

a power system extrusion formed of heat conductive material having a flat interior floor, first and second vertical sidewalls, respective horizontally running wings projecting upwardly from respective side top surfaces thereof, and an opening defined between said first and second horizontally running wings, the power system extrusion further having a horizontally running channel configured to receive an electrical connector and formed on the interior of one of said first and second sidewalls and first and second horizontally facing channels formed on said flat interior floor, the opening of the first channel facing the opening of the second channel;

an LED light module having a rectangular module body attached to said power system extrusion and shaped so as to close said opening so as to define a closed chamber within the power system extrusion and the LED light module, the LED light module having a surface mounting a circuit board carrying at least one LED; the LED light module further having interior side surfaces positioned to contact the respective inner sides of said horizontally running wings;

a female end cap shaped to close a first end of said chamber, the female end cap having a horizontally extending tongue shaped and dimensioned to slidably mate with said first and second horizontally facing channels, said female end cap having an opening located in a vertical face thereof shaped to receive a first female electrical connector and first and second slots formed in a vertical front face thereof;

a male end cap having a horizontally extending tongue shaped and dimensioned to slidably mate with said first and second horizontally facing channels and respective horizontally running wings projecting upwardly from respective side top surfaces thereof and shaped and positioned to align with the horizontally running wings of said power system extrusion and to contact the interior side surfaces of said LED module, said male end cap further having an opening located in a vertical face thereof shaped to receive a first male electrical connector and first and second tongues projecting from said vertical face and shaped to mate with said first and second slots; and

a power box component having respective slots positioned to mate with the respective tongues of said male end cap and having a second female electrical connector positioned to mate with the first male electrical connector mounted in said male end cap and shaped to close a second end of said chamber, the power box component having an electrical cable extending

through a surface thereof and configured to be attached a source of electrical power external to said LED light fixture.

8. The LED light fixture of claim **7** further comprising an LED driver module located within said chamber and a mounting bracket mounted to an under surface of said LED light module, the mounting bracket being spring biased so as to press a surface of the LED driver module against the flat interior floor of said power system extrusion so as to improve heat transfer from the driver module to the power system extrusion.

9. The LED light fixture of claim **7** wherein said first male electrical connector comprises a five pin electrical connector and wherein said second female electrical connector comprises a five receptacle electrical connector wherein each of the five receptacles is configured to mate with a respective one of the five pins.

10. The LED light fixture of claim **9** wherein each of the first male and second female electrical connectors have a trapezoidal cross-section.

11. An LED light fixture apparatus comprising:

first and second LED light fixture modules, each LED light fixture module comprising:

a power system extrusion having an open top and first and second open ends, the power system extrusion comprising a channel configured to conduct a plurality of electrical leads to a power system extrusion electrical connector, the power system extrusion electrical connector being configured to tap power from said plurality of electrical leads for supply to an LED driver module;

a first end cap attached to the first open end of the power system extrusion and closing said first open end, said first end cap having a first female electrical connector located in a front face thereof;

a second end cap attached to the second open end of the power system extrusion and closing said second open end, the second end cap having a male electrical connector located in a front face thereof, the male electrical connector being of a type which mates with said first female electrical connector;

an LED light module having a circuit board mounted in a recessed area of a top surface thereof, the circuit board carrying one or more LEDs, the LED light module being removably attachable to close the open top end of said power system extrusion;

an LED driver module disposed within a chamber formed by said LED light module and said power system extrusion for supplying power to said one or more LEDs;

wherein the male electrical connector of the second end cap of one of said first and second LED light fixture modules is plugged into the female electrical connector of the first female end cap of the other one of the first and second LED light fixture modules; and

wherein one of the second end caps has a horizontally extending tongue shaped and dimensioned to slidably mate with first and second horizontally facing channels of one of said power system extrusions, said one of the second end caps further having an opening located in the front face thereof shaped to receive the first male electrical connector.

12. The LED light fixture of claim **11** further comprising a power box component having respective slots positioned to mate with respective first and second tongues projecting from the front face of one of said second end caps, the power box component further having a second female electrical connector positioned to mate with the male electrical connector of said one of said second end caps, the power box component having an electrical cable extending through a surface thereof and configured to be attached to a source of electrical power external to said LED light fixture.

13. The LED light fixture of claim **12** wherein each said male electrical connector comprises a five pin electrical connector and wherein each said second female electrical connector comprises a five receptacle electrical connector wherein each of the five receptacles is configured to mate with a respective one of the five pins.

14. The LED light fixture of claim **13** wherein each of the male electrical connectors and the second female electrical connector have a trapezoidal cross-section.

15. An LED light fixture apparatus comprising:

first and second LED light fixture modules, each LED light fixture module comprising:

a power system extrusion having an open top and first and second open ends, the power system extrusion comprising a channel configured to conduct a plurality of electrical leads to a power system extrusion electrical connector, the power system extrusion electrical connector being configured to tap power from said plurality of electrical leads for supply to an LED driver module;

a first end cap attached to the first open end of the power system extrusion and closing said first open end, said first end cap having a first female electrical connector located in a front face thereof;

a second end cap attached to the second open end of the power system extrusion and closing said second open end, the second end cap having a male electrical connector located in a front face thereof, the male electrical connector being of a type which mates with said first female electrical connector;

an LED light module having a circuit board mounted in a recessed area of a top surface thereof, the circuit board carrying one or more LEDs, the LED light module being removably attachable to close the open top end of said power system extrusion;

an LED driver module disposed within a chamber formed by said LED light module and said power system extrusion for supplying power to said one or more LEDs;

wherein the male electrical connector of the second end cap of one of said first and second LED light fixture modules is plugged into the female electrical connector of the first end cap of the other one of the first and second LED light fixture modules; and

wherein one of the first end caps is shaped to close a first end of said chamber, the said one of the first end caps having a horizontally extending tongue shaped and dimensioned to slidably mate with first and second horizontally facing channels located at said first end, said one of said first end caps having an opening located in the front face thereof shaped to receive a first female electrical connector, the front face further having first and second slots formed therein.

16. The LED light fixture of claim **15** wherein the power tapped from said power extrusion s stem electrical connector for supply to an LED driver module is A.C. line power.

17. An LED light fixture apparatus comprising:

first and second LED light fixture modules, wherein one of the first and second LED light fixture modules

directly plugs into the other one of the first and second LED light fixture modules, each LED light fixture module comprising:

a power system extrusion having first and second open ends;

a first end cap attached to the first open end of the power system extrusion and closing said first open end, said first end cap having a female electrical connector located in a front face thereof;

a second end cap attached to the second open end of the power system extrusion and closing said second open end, the second end cap having a male electrical connector located in a front face thereof, the male electrical connector being of a type which mates with said female electrical connector;

an LED light module having a circuit board mounted in a recessed area thereof, the circuit board carrying one or more LEDs, the LED light module being removably attachable to said power system extrusion;

an LED driver module for supplying power to said one or more LEDs; and

a mounting bracket attached to said LED driver module, the mounting bracket being attached to the LED light module by a resilient biasing mechanism which forces a surface of said LED driver module against a surface of said power system extrusion;

wherein the male electrical connector of the second end cap of one of said first and second LED light fixture modules is plugged into the female electrical connector of the first end cap of the other one of the first and second LED light fixture modules.

18. An LED light fixture apparatus comprising:

first and second LED light fixture modules, each LED light fixture module comprising:

a power system extrusion having an open top and first and second open ends, the power system extrusion comprising a channel configured to conduct a plurality of electrical leads to a power system extrusion electrical connector, the power system extrusion electrical connector being configured to tap power from said plurality of electrical leads for supply to an LED driver module;

a first end cap attached to the first open end of the power system extrusion and closing said first open end, said first end cap having a first female electrical connector located in a front face thereof;

a second end cap attached to the second open end of the power system extrusion and closing said second open end, the second end cap having a male electrical connector located in a front face thereof, the male electrical connector being of a type which mates with said first female electrical connector;

an LED light module having a circuit board mounted in a recessed area of a top surface thereof, the circuit board carrying one or more LEDs, the LED light module being removably attachable to close the open top end of said power system extrusion;

an LED driver module disposed within a chamber formed by said LED light module and said power system extrusion for supplying power to said one or more LEDs;

wherein the male electrical connector of the second end cap of one of said first and second LED light fixture modules is plugged into the female electrical connector of the first end cap of the other one of the first and second LED light fixture modules; and

the LED light fixture apparatus further comprising a mounting bracket mounted to an under surface of each said LED light module, the mounting bracket being spring biased so as to press a surface of the LED driver module against a flat interior floor of the power system extrusion to which the respective LED light module is removably attachable so as to improve heat transfer from each LED driver module to its respective power system extrusion.

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