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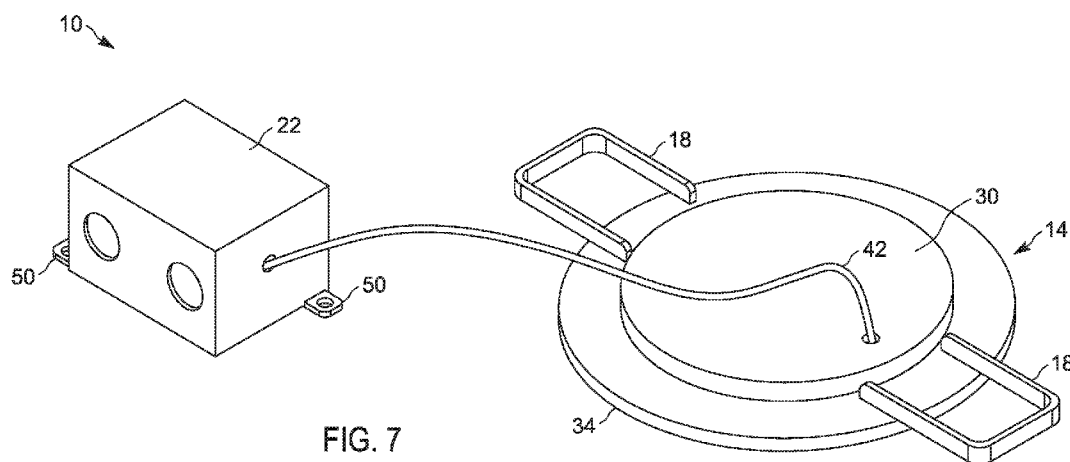


FIG. 7

(57) Abstract: A light fixture includes a housing for supporting a light source and an enclosure for supporting a driver in electrical communication with the light source. The enclosure is selectively supported in one of a first position and a second position while maintaining electrical communication between the driver and the light source in both positions. The enclosure is directly coupled to the housing in the first position, and the enclosure is supported separately from the housing in the second position.



LIGHT FIXTURE WITH REMOVABLE DRIVER ENCLOSURE

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the benefit of prior-filed, co-pending U.S. Provisional Patent Application No. 62/532,033, filed July 13, 2017, the entire contents of which are incorporated by reference.

BACKGROUND

[0002] The present disclosure relates to light fixtures, and particularly to a light fixture including a driver for controlling current to a light emitting element.

SUMMARY

[0003] In one independent aspect, a light fixture includes a housing for supporting a light emitter and an enclosure supporting a driver in electrical communication with the light emitter. The enclosure is capable of being selectively supported in each of a first position and a second position while maintaining electrical communication between the driver and the light emitter in both the first position and the second position. The enclosure is directly coupled to the housing in the first position, and the enclosure is supported separately from the housing in the second position.

[0004] In another independent aspect, a light fixture includes a housing and an enclosure. The housing includes a first side and a second side opposite the first side. The housing is coupled to a support structure and supports a light emitter. The enclosure supports a driver in electrical communication with the light emitter. The enclosure is capable of being selectively supported in each of a first position and a second position while maintaining electrical communication between the driver and the light emitter in each position. The enclosure is directly coupled to the housing in the first position, and the enclosure is directly coupled to a support structure separately from the housing in the second position.

[0005] In yet another independent aspect, a method for installing a light fixture includes: determining whether the light fixture may be mounted in a desired location while an enclosure supporting a control driver is directly coupled to a housing; if the enclosure cannot be directly

coupled to the housing with the fixture in a desired location, mounting the housing in the desired location, and mounting the enclosure in a separate location while maintaining electrical communication between the control driver in the enclosure and a light emitter in the housing; and if the enclosure can be directly coupled to the housing with the fixture in a desired location, mounting the housing in the desired location with the enclosure directly coupled to the housing.

[0006] Other aspects of the disclosure will become apparent by consideration of the detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] FIG. 1 is a perspective view of a luminaire.

[0008] FIG. 2 is a plan view of the luminaire of FIG. 1.

[0009] FIG. 3 is another plan view of the luminaire of FIG. 1.

[0010] FIG. 4 is a side elevation view of the luminaire of FIG. 1.

[0011] FIG. 5 is another side elevation view of the luminaire of FIG. 1.

[0012] FIG. 6 is a perspective view of the luminaire of FIG. 1 with fasteners removed.

[0013] FIG. 7 is a perspective view of the luminaire of FIG. 1 with an enclosure separate from a fixture housing.

[0014] FIG. 8 is a perspective view of a luminaire according to another embodiment, with an enclosure coupled to the fixture housing.

[0015] FIG. 9 is a plan view of the luminaire of FIG. 8.

[0016] FIG. 10 is a plan view of the luminaire of FIG. 8, with the enclosure supported separate from the fixture housing.

DETAILED DESCRIPTION

[0017] Before any embodiments are explained in detail, it is to be understood that the disclosure is not limited in its application to the details of construction and the arrangement of components set forth in the following description or illustrated in the following drawings. The disclosure is capable of other embodiments and of being practiced or of being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting. Use of "including" and "comprising" and variations thereof as used herein is meant to encompass the items listed thereafter and equivalents thereof as well as additional items. Use of "consisting of" and variations thereof as used herein is meant to encompass only the items listed thereafter and equivalents thereof. Unless specified or limited otherwise, the terms "mounted," "connected," "supported," and "coupled" and variations thereof are used broadly and encompass both direct and indirect mountings, connections, supports, and couplings.

[0018] FIGS. 1-5 illustrate a light fixture or luminaire 10 including a housing 14, clips or brackets 18, and an enclosure 22. As shown in FIG. 3, the housing 14 supports one or more light-emitting elements or light sources (e.g., light-emitting diodes or LEDs – not shown) and a lens or optic 26 for providing a desired light output. In the illustrated embodiment, the housing 14 is formed as a thin, disc-like structure having a first side 30 and a second side 34, and the optic 26 is formed on the second side 34. In other embodiments, the housing 14 may have a different shape. The brackets 18 are coupled to the housing 14 and extend from the housing 14 in opposite directions. The brackets 18 may be coupled to a support structure (e.g., a stud or beam – not shown) to support the luminaire 10 relative to a wall or ceiling. In the illustrated embodiment, the brackets 18 have a U-shape; in other embodiments, the brackets may have a different shape.

[0019] Referring to FIGS. 1, 4, and 5, the enclosure 22 houses and/supports one or more drivers for driving electric current to the light sources. One or more wires or conduits 42 provide electrical communication between the drivers in the enclosure 22 and the light source(s) in the housing 14. The enclosure 22 is removably coupled to the housing 14 (e.g., by fasteners 46). In the illustrated embodiment, the enclosure 22 may engage or be coupled to the first side 30 of the housing 14, opposite the optic 26. As shown in FIG. 6, the fasteners 46 may be removed from one or more mounting features 50 to uncouple the enclosure 22. Referring to FIG. 7, the

enclosure 22 may therefore be separated from the housing 14 while still electrically connected to the light source via the conduit 42. As a result, the enclosure 22 may be secured to a separate portion of the support structure.

[0020] In some circumstances, the presence of studs or beams located behind a finished surface (e.g., drywall) may interfere with installing an electrical box and/or fixture in a desired position, and may limit the types of electrical boxes/fixtures that may be installed in that position. This problem may be further complicated if fixture is a recessed fixture. The enclosure 22 of the luminaire 10 can be directly coupled to the housing 14, or the enclosure 22 can be separated from the housing 14 and supported remote from the housing 14. The removable coupling provides better versatility for mounting the luminaire 10.

[0021] During installation, an operator may first try to attach or mount (e.g., on a wall or ceiling) the luminaire 10 with the enclosure 22 directly coupled to the housing 14. However, the operator may encounter a stud or support member in the desired mounting position for the luminaire 10. The operator can uncouple the enclosure 22 from the housing 14 while the driver(s) in the enclosure 22 remain in electrical communication with the light source(s) in the housing 14. The operator may then mount the housing 14 in the desired position, and mount the enclosure in a different location offset from the housing 14, for example, on the support member.

[0022] In the illustrated embodiment, the mounting features 50 are coupled to the enclosure 22; in other embodiments, the enclosure 22 may be removably coupled to the housing 14 in a different manner. In another exemplary embodiment, illustrated in FIGS. 8-10, biased retention springs 54 engage mounting features 50 to removably couple the enclosure 22 to the housing 14. In the illustrated embodiment, the springs 54 are positioned on the housing 14 and the mounting features 50 are positioned on the enclosure 22; in other embodiments, springs may be positioned on the enclosure 22 and the mounting features may be positioned on the housing 14. As shown in FIG. 9, the biased retention springs 54 may be uncoupled from the mounting features 50 (e.g., by depressing a biasing member) to uncouple the enclosure 22 from the housing 14. The enclosure 22 may be separated from the housing 14 while still electrically connected to the light source via conduit 42.

[0023] In some circumstances, the presence of studs or beams located behind a finished surface (e.g. drywall) may interfere with installing an electrical box and/or fixture in a desired position, particularly with regard to maintaining electrical connection throughout the installation process. In some embodiments, the conduit 42 includes a first portion 58 operably coupled to the light source, and a second portion 62 operably connected to the enclosure 22. The first portion 58 and the second portion 62 are operably connected together by an intermediate connector 66. The intermediate connector 66 includes a first connector 70 coupled to the first portion 58 of the conduit 42, and a second connector 74 coupled to the second portion 62 of the conduit 42. The first connector 70 is engageable with the second connector 74 to enable electrical communication between the enclosure 22 and the light source, and disengageable to facilitate luminaire 10 installation.

[0024] During installation, an operator may first try to attach or mount (e.g., on a wall or ceiling) the luminaire 10 with the enclosure 22 in electrical communication with the light source. The operator may encounter a stud or support member however, that makes installing the luminaire 10 with the enclosure 22 in electrical communication with the light source difficult. In another situation, the operator may have trouble securing the enclosure 22 to a separate portion of the support structure or a different support structure while the enclosure 22 is in electrical communication with the light source. The operator can disengage the first connector 70 of the intermediate connector 66 from the second connector 74 to proceed with the installation, and the first connector 70 can be re-connected to the second connector 74 to re-enable electrical communication between the enclosure 22 and the light source when convenient to do so.

[0025] In another situation referring to the embodiment illustrated in FIG. 8 and FIG. 9, an operator may first try to attach or mount (e.g., on a wall or ceiling) the luminaire 10 while the first connector 70 is not engaged with the second connector 74 so that the enclosure 22 is not in electrical communication with the light source. The first connector 70 can be subsequently connected to the second connector 74 to enable electrical communication between the enclosure 22 and the light source when convenient to do so.

[0026] The embodiment(s) described above and illustrated in the figures are presented by way of example only and are not intended as a limitation upon the concepts and principles

presented herein. As such, it will be appreciated that variations and modifications exist within the scope and spirit of one or more independent aspects as described.

CLAIMS

What is claimed is:

1. A light fixture comprising:
a housing supporting a light emitter; and
an enclosure supporting a driver in electrical communication with the light emitter, the enclosure capable of being selectively supported in each of a first position and a second position while maintaining electrical communication between the driver and the light emitter in both the first position and the second position, the enclosure being directly coupled to the housing in the first position, and the enclosure being supported separately from the housing in the second position.
2. The light fixture according to claim 1, wherein the housing includes an optic covering at least a portion of the light emitter.
3. The light fixture according to claim 2, wherein the enclosure is directly coupled to a side of the housing opposite the optic when the enclosure is in the first position.
4. The light fixture according to claim 1, wherein the enclosure includes at least one mounting feature, the at least one mounting feature operable to directly couple the enclosure to the housing in the first position and operable to couple the enclosure to a support structure in the second position.
5. The light fixture according to claim 4, wherein the at least one mounting feature includes a plurality of fasteners.
6. The light fixture according to claim 4, wherein the at least one mounting feature includes a biased retention spring.
7. The light fixture according to claim 1, wherein the housing includes at least one bracket operable to directly couple the housing to a support structure.
8. The light fixture according to claim 7, wherein the brackets extend from the housing in opposite directions.

9. The light fixture according to claim 1, wherein a conduit provides electrical communication between the driver and the light emitter in both positions.
10. The light fixture according to claim 9, wherein the conduit includes a first portion removably coupled to a second portion by an intermediate connector.
11. A light fixture comprising:
 - a housing including a first side and a second side opposite the first side, the housing coupled to a support structure and supporting a light emitter; and
 - an enclosure supporting a driver in electrical communication with the light emitter, the enclosure capable of being selectively supported in each of a first position and a second position while maintaining electrical communication between the driver and the light emitter in each position, the enclosure being directly coupled to the housing in the first position, and the enclosure being directly coupled to a support structure separately from the housing in the second position.
12. The light fixture according to claim 11, wherein, in the second position, the enclosure and housing are coupled to different support structures.
13. The light fixture according to claim 11, wherein, in the first position, the enclosure directly coupled to a side of the housing opposite an optic.
14. The light fixture according to claim 11, wherein the enclosure includes at least one mounting feature operable to directly couple the enclosure to the housing in the first position and operable to couple the enclosure to a support structure in the second position.
15. The light fixture according to claim 14, wherein the at least one mounting feature includes a plurality of fasteners.
16. The light fixture according to claim 14, wherein the at least one mounting feature includes a biased retention spring.
17. The light fixture according to claim 11, wherein a conduit provides electrical communication between the driver and the light emitter in both positions, the conduit including a first portion removably coupled to a second portion by an intermediate connector.

18. A method for installing a light fixture, the method comprising the steps of:
- determining whether the light fixture may be mounted in a desired location while an enclosure supporting a control driver is directly coupled to a housing;
 - if the enclosure cannot be directly coupled to the housing with the fixture in a desired location, mounting the housing in the desired location, and mounting the enclosure in a separate location while maintaining electrical communication between the control driver in the enclosure and a light emitter in the housing; and
 - if the enclosure can be directly coupled to the housing with the fixture in a desired location, mounting the housing in the desired location with the enclosure directly coupled to the housing.
19. A method for installing a light fixture according to claim 18, further comprising:
- disabling the electrical communication between the driver and the emitter; and
 - re-enabling the electrical communication between the driver and the emitter.
20. A method for installing a light fixture according to claim 19, wherein disabling the electrical communication between the driver and the emitter includes disconnecting a first portion of a conduit from a second portion of the conduit via an intermediate connector; and,
- enabling the electrical communication between the driver and the emitter includes connecting the first portion of the conduit to the second portion of the conduit via the intermediate connector.

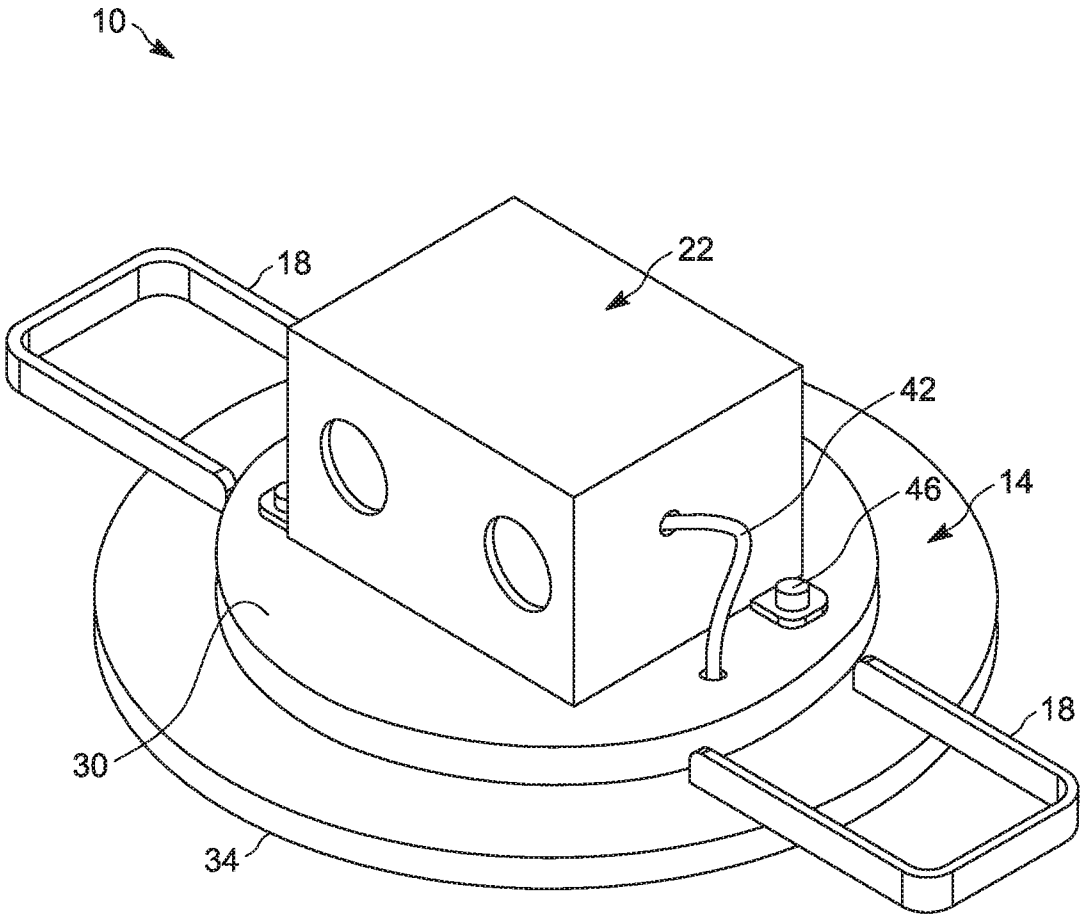


FIG. 1

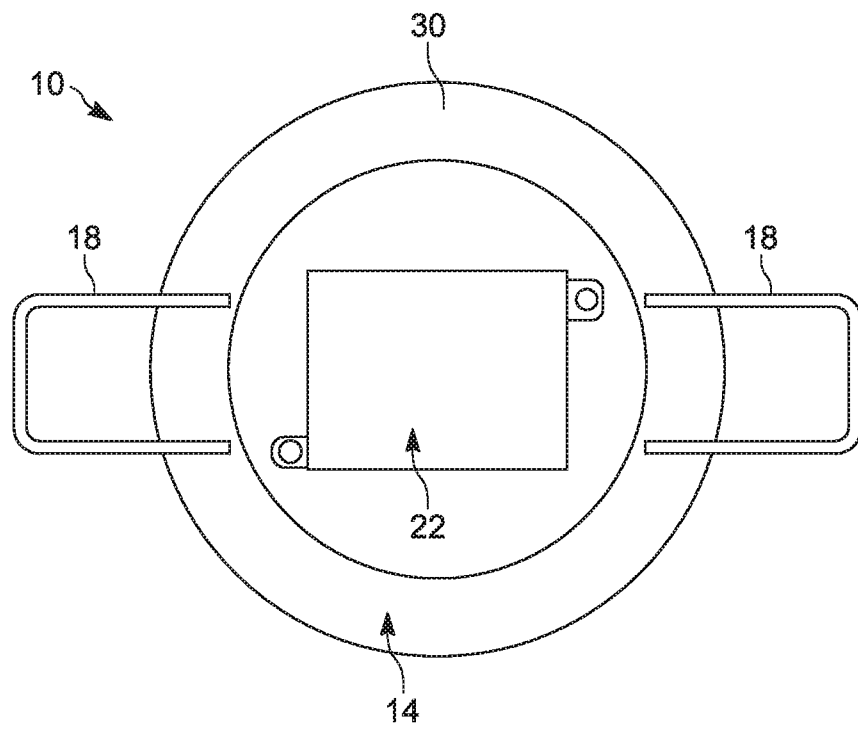


FIG. 2

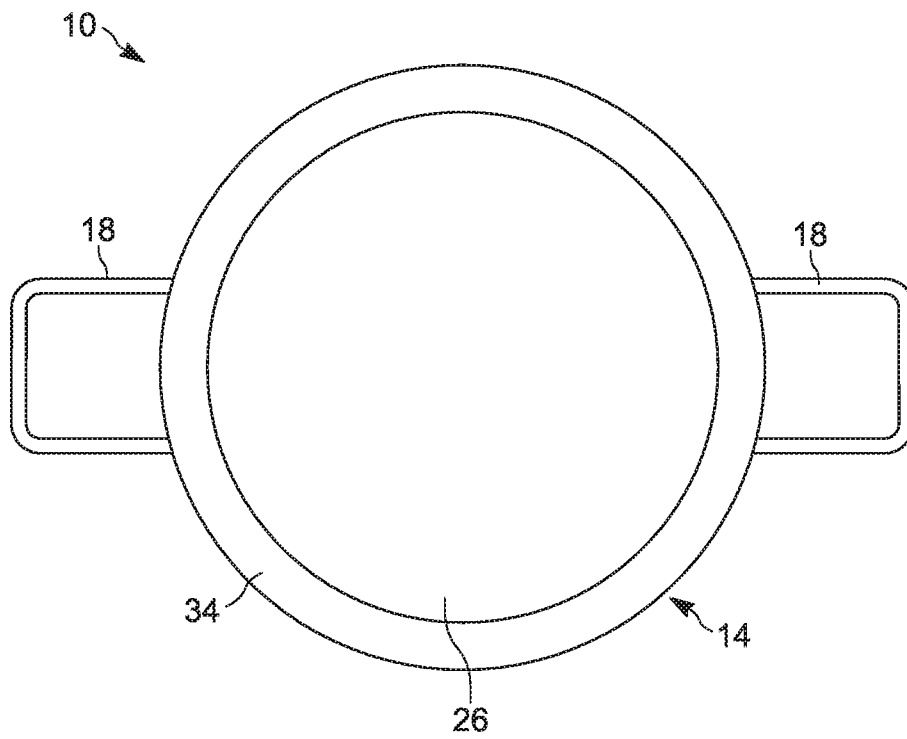


FIG. 3

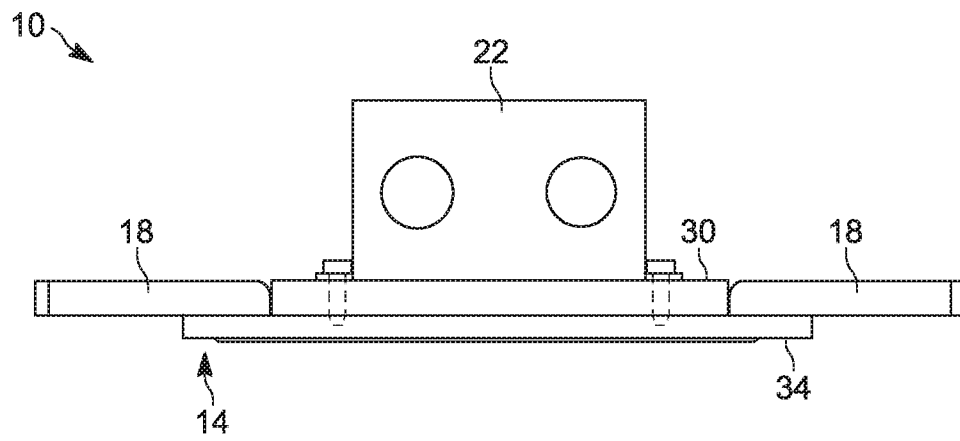


FIG. 4

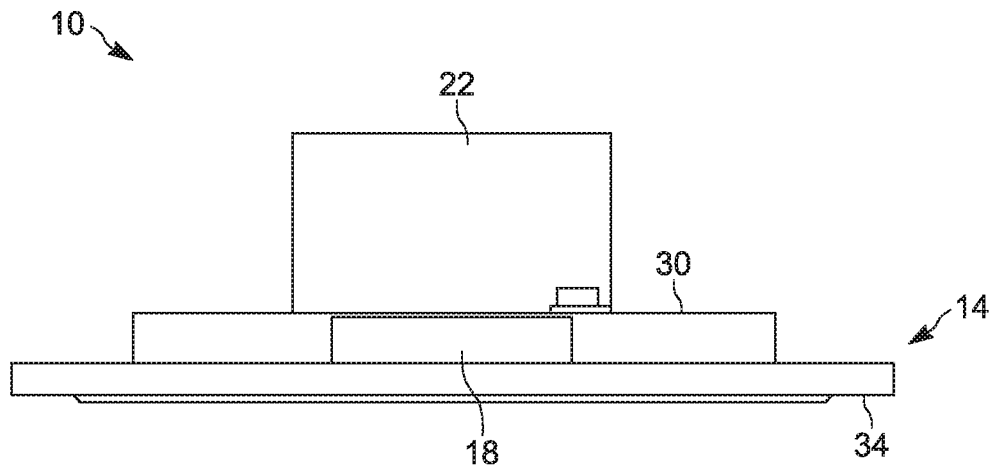


FIG. 5

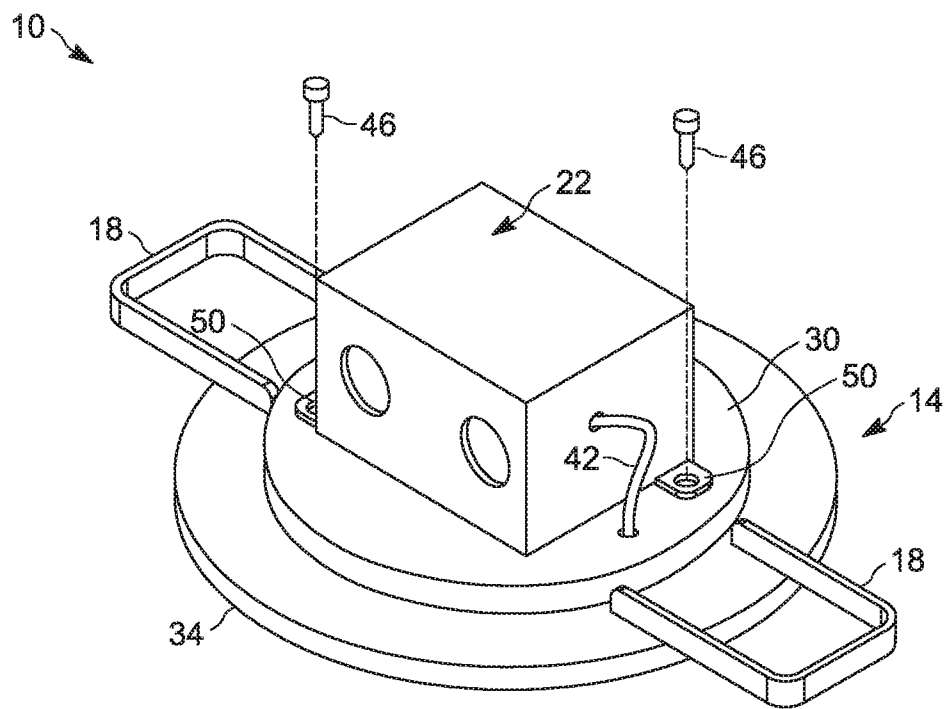


FIG. 6

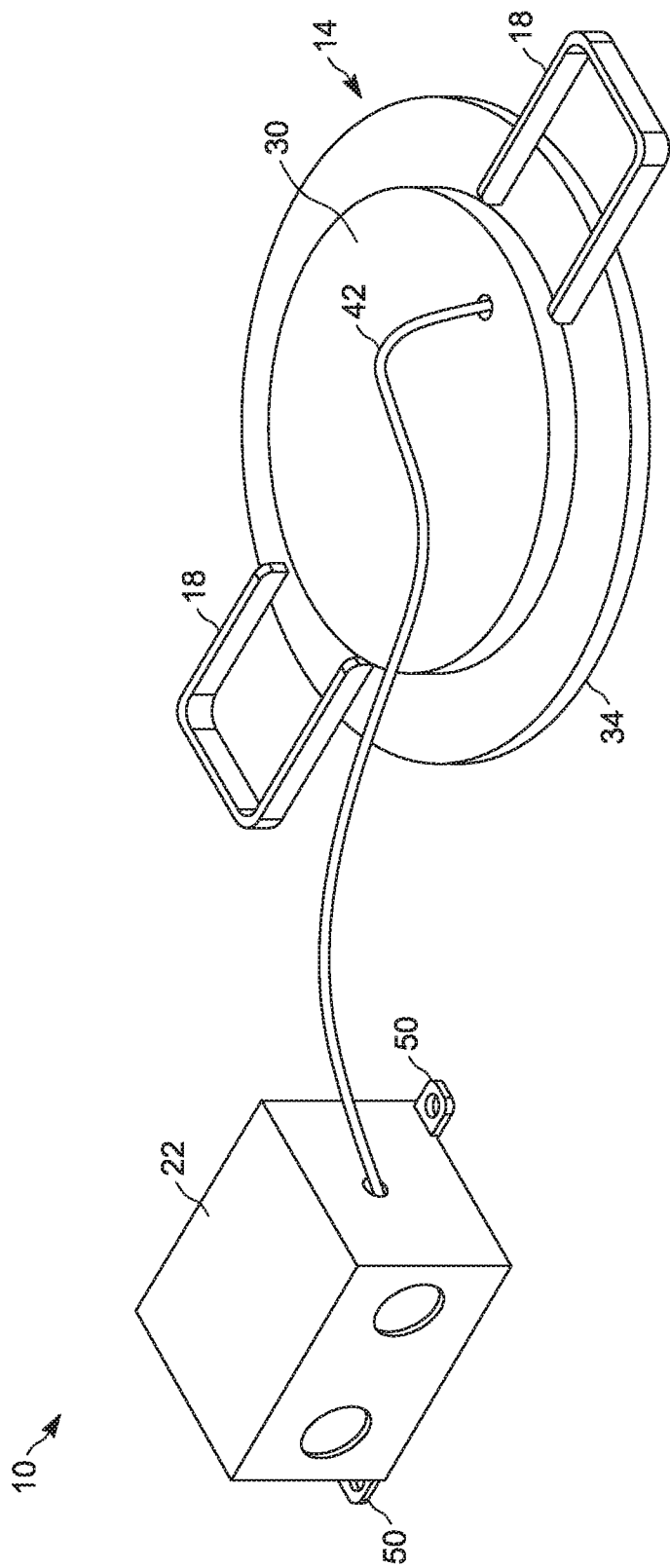


FIG. 7

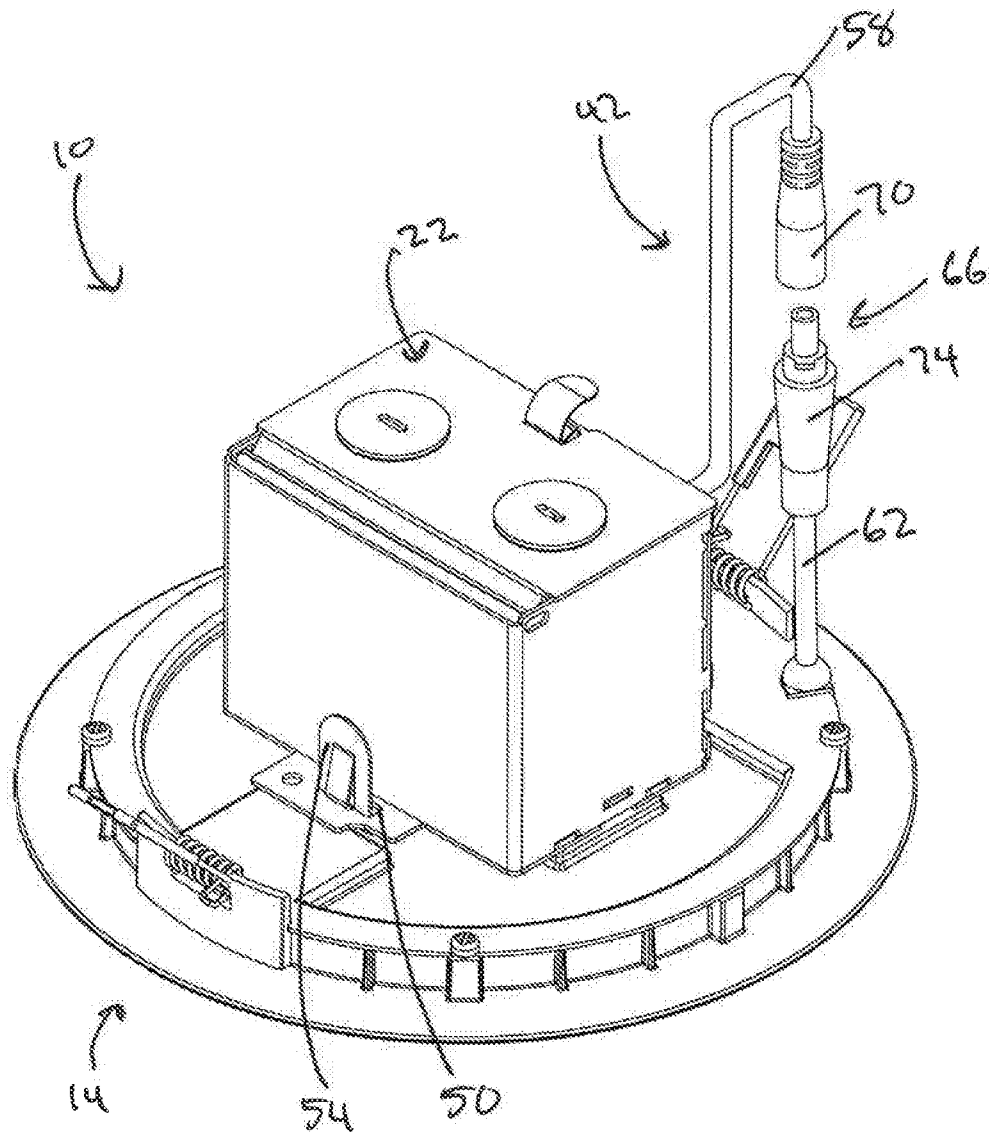


FIG. 8

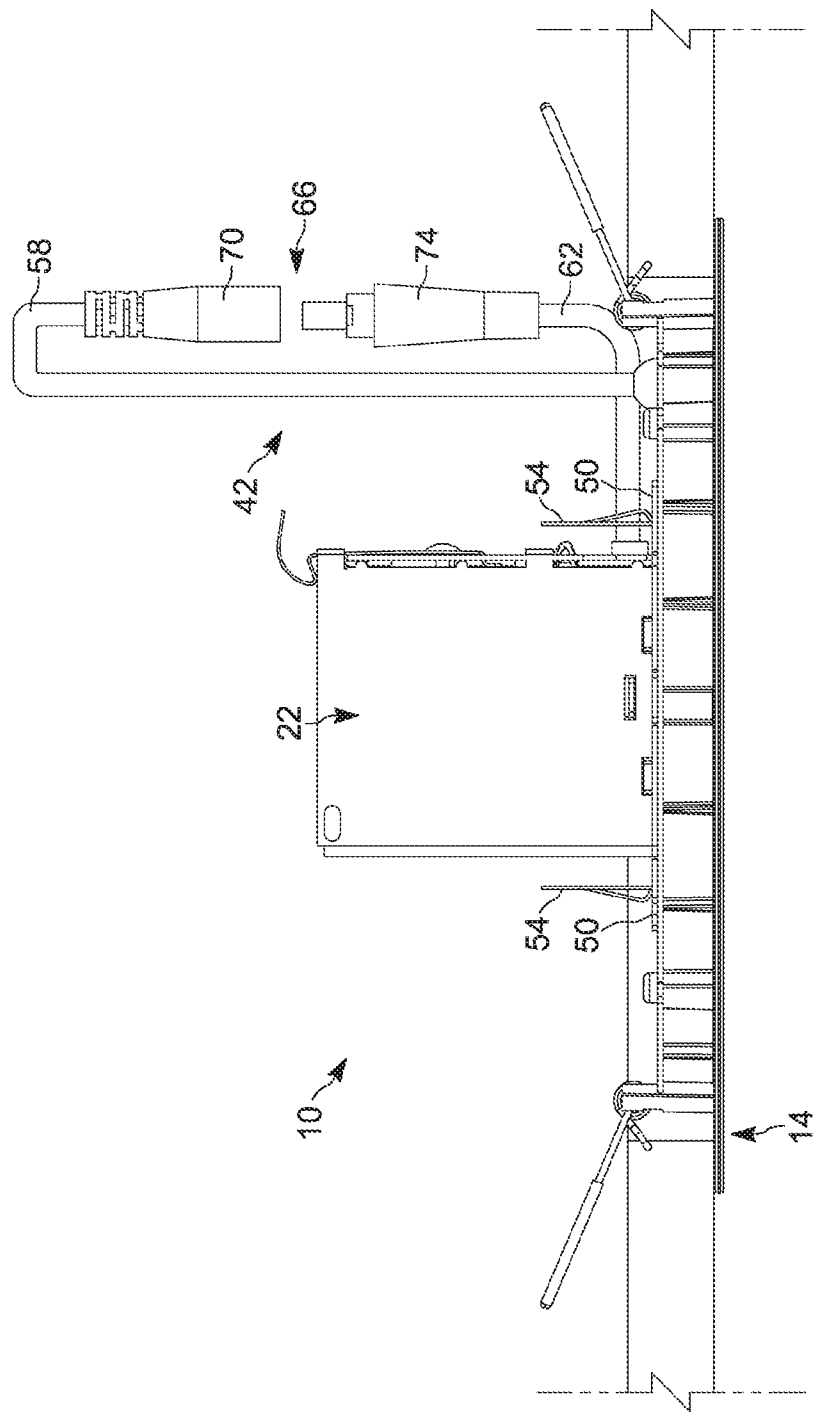
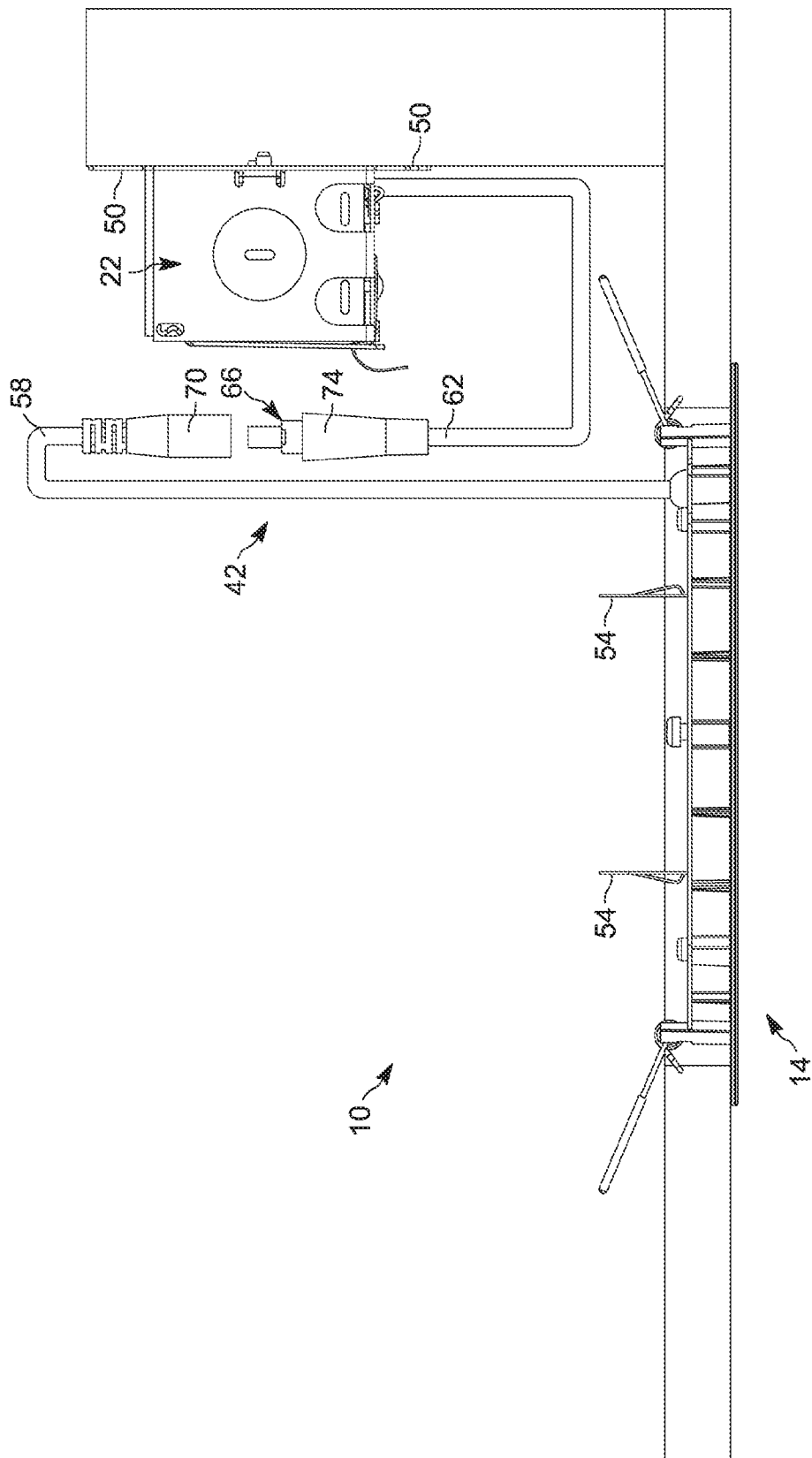


FIG. 9



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2018/042110

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - F21V 17/10; F21S 8/00; F21S 8/02; F21S 8/04; F21V 17/00; F21V 17/12; F21V 21/00 (2018.01)

CPC - F21V 17/10; F21S 8/00; F21S 8/02; F21S 8/026; F21S 8/04; F21S 8/043; F21V 17/00; F21V 17/107; F21V 17/12; F21V 21/00; F21V 21/02; F21V 21/04; F21V 21/048; F21V 21/049; F21V 21/14; F21V 21/30 (2018.08)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

See Search History document

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

USPC - 362/362; 362/364; 362/365; 362/368; 362/370 (keyword delimited)

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

See Search History document

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2009/0080189 A1 (WEGNER) 26 March 2009 (26.03.2009) entire document	1-5, 7-15, 17-20
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Y		6, 16
Y	US 9,627,830 B1 (WRONSKI et al) 18 April 2017 (18.04.2017) entire document	6, 16
A	US 2010/0296272 A1 (ROOS et al) 25 November 2010 (25.11.2010) entire document	1-20
A	US 2015/0276141 A1 (WHITE et al) 01 October 2015 (01.10.2015) entire document	1-20
A	US 9,429,307 B1 (KATHAWATE et al) 30 August 2016 (30.08.2016) entire document	1-20

☐ Further documents are listed in the continuation of Box C.☐ See patent family annex.

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

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Date of the actual completion of the international search

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Date of mailing of the international search report

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