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Cercone

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(45) **Date of Patent: Apr. 12, 2016**

(54) **MOTORIZED LIGHTING FIXTURE WITH MOTOR AND LIGHT DIMMING CONTROL**

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(73) Assignee: **Brightline, Inc.**, Bridgeville, PA (US)

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(21) Appl. No.: **13/368,785**

(22) Filed: **Feb. 8, 2012**

(65) **Prior Publication Data**

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(51) **Int. Cl.**

F21S 8/02	(2006.01)
H05B 33/08	(2006.01)
F21V 14/02	(2006.01)
H05B 37/02	(2006.01)

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

CPC ***F21S 8/026*** (2013.01); ***F21V 14/02*** (2013.01); ***H05B 33/0803*** (2013.01); *H05B 33/0845* (2013.01); *H05B 37/0245* (2013.01)

(58) **Field of Classification Search**

USPC 362/220, 285, 286, 287, 427, 428

See application file for complete search history.

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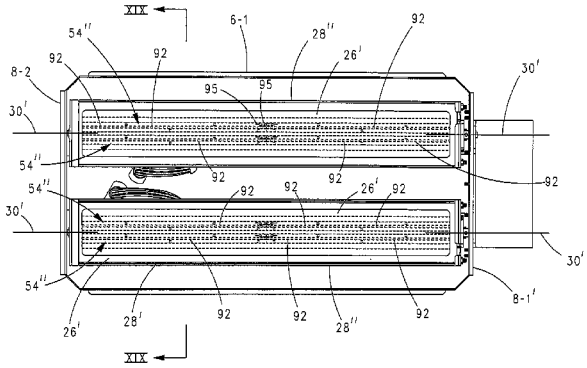
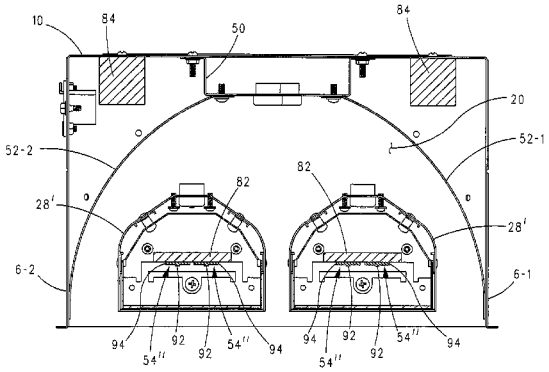
(74) *Attorney, Agent, or Firm* — The Webb Law Firm

(57) **ABSTRACT**

A lighting fixture includes a housing defining a longitudinal axis, a lamp carriage assembly disposed inside the housing and supporting one or more lamps parallel with the longitudinal axis, and a motor coupled between the housing and the lamp carriage assembly and operative for pivoting the lamp carriage assembly relative to the housing about a pivot axis of the lamp carriage assembly. A method of operating the lighting fixture includes (a) causing a lamp carriage assembly disposed inside the housing to be in a home position and outputting light in response to illumination of the one or more lamps of the lamp carriage assembly, and (b) causing the lamp carriage assembly to pivot about its pivot axis thereby redirecting where the light output by the lamp carriage assembly travels in response to the illumination of the one or more lamps of the lamp carriage assembly.

11 Claims, 18 Drawing Sheets





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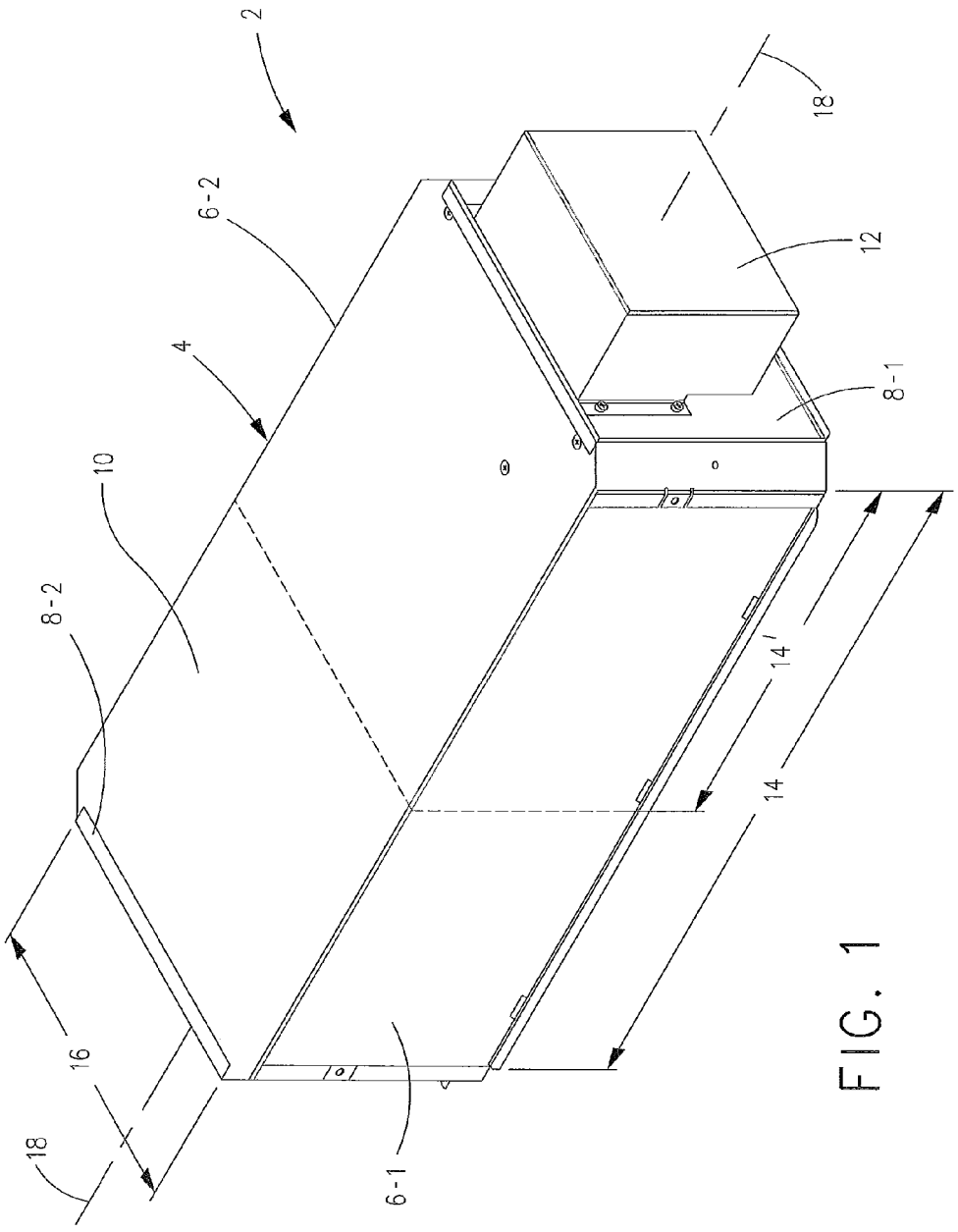


FIG. 1

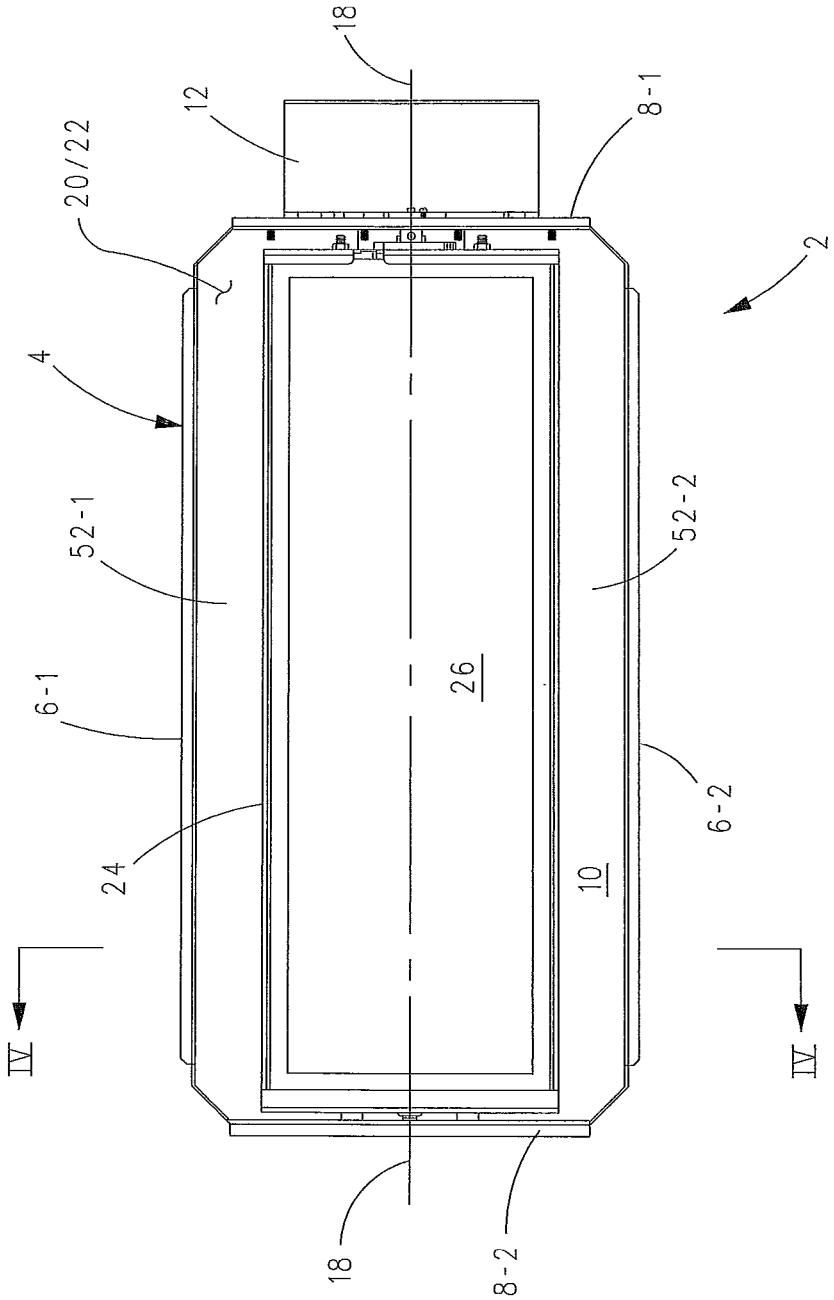
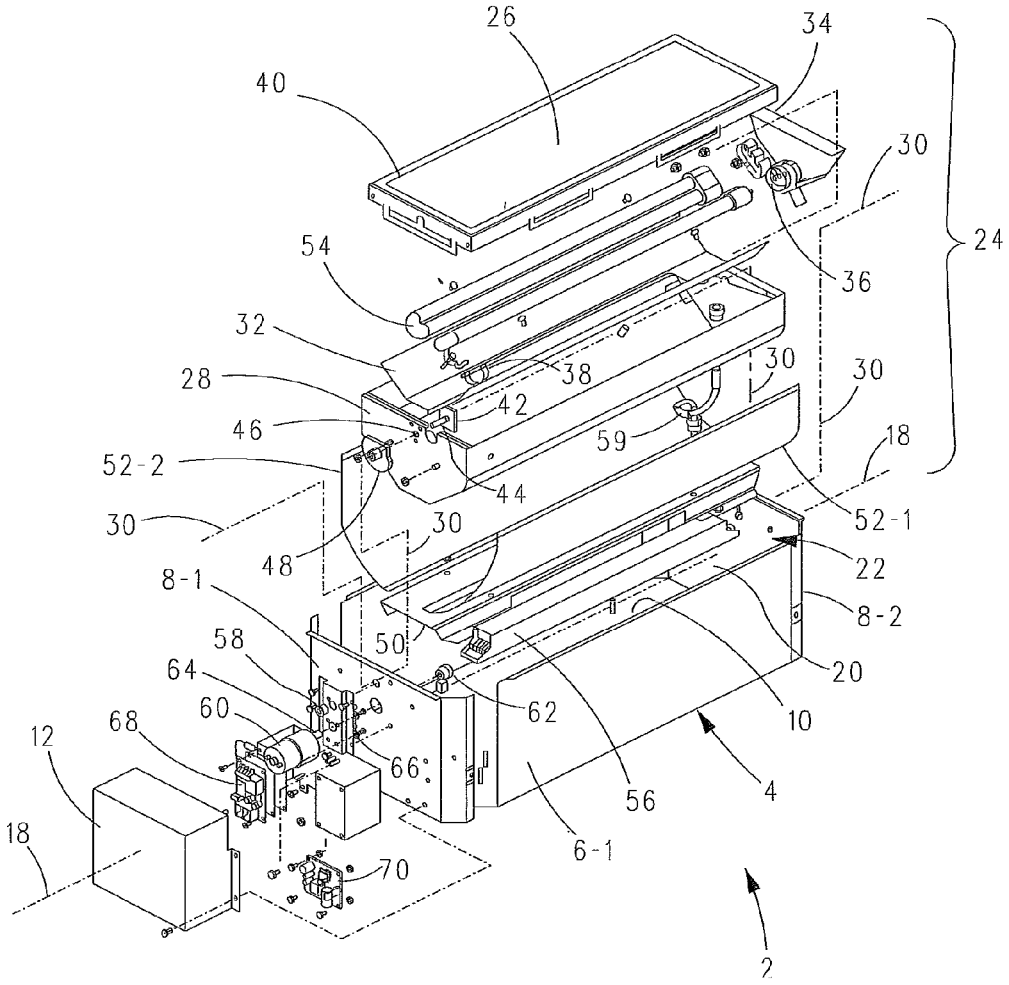


FIG. 2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30
30
28
42
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44
30
30
52-1
48
22
8-1
8-2
58
50
20
64
62
60
10
12
68
66
56
4
18
6-1
70
2

FIG. 3

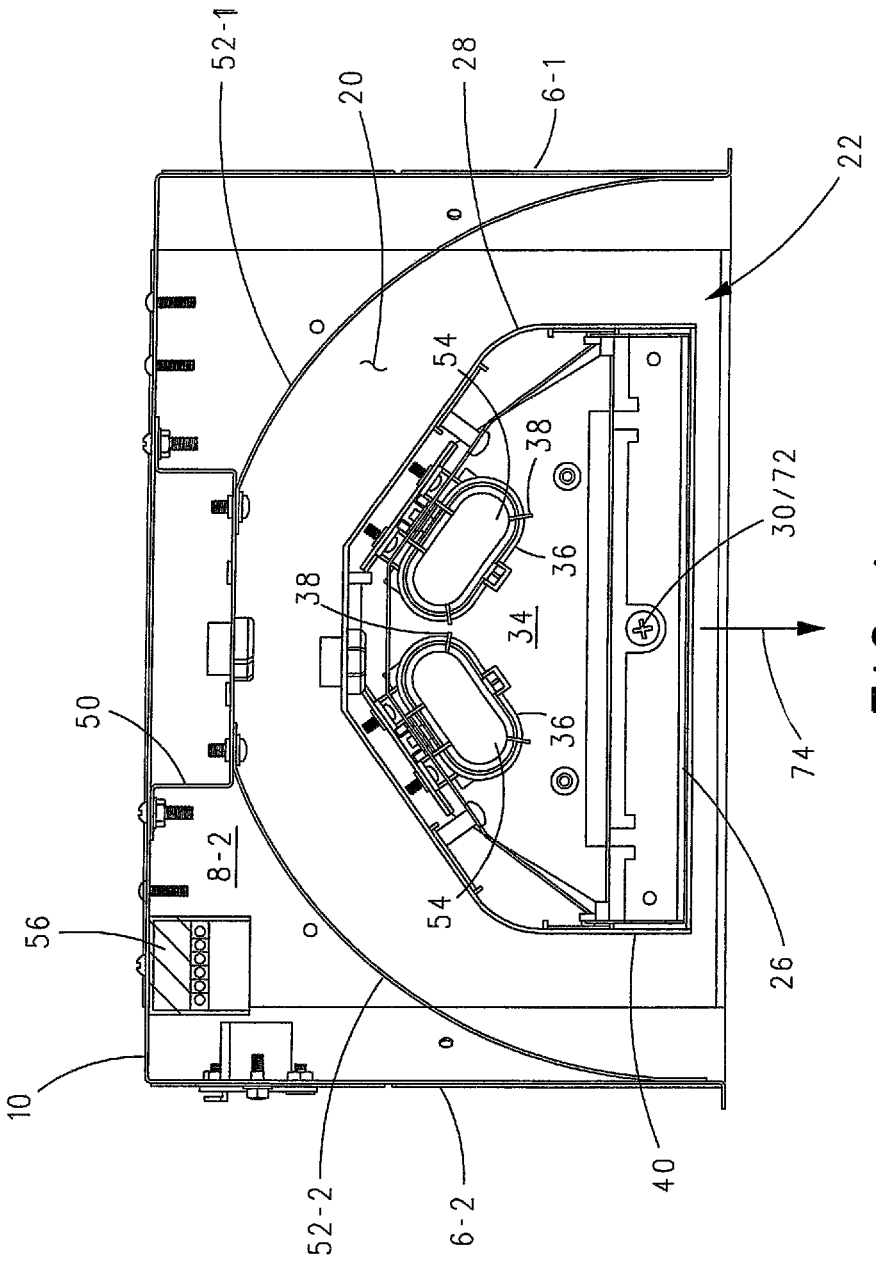
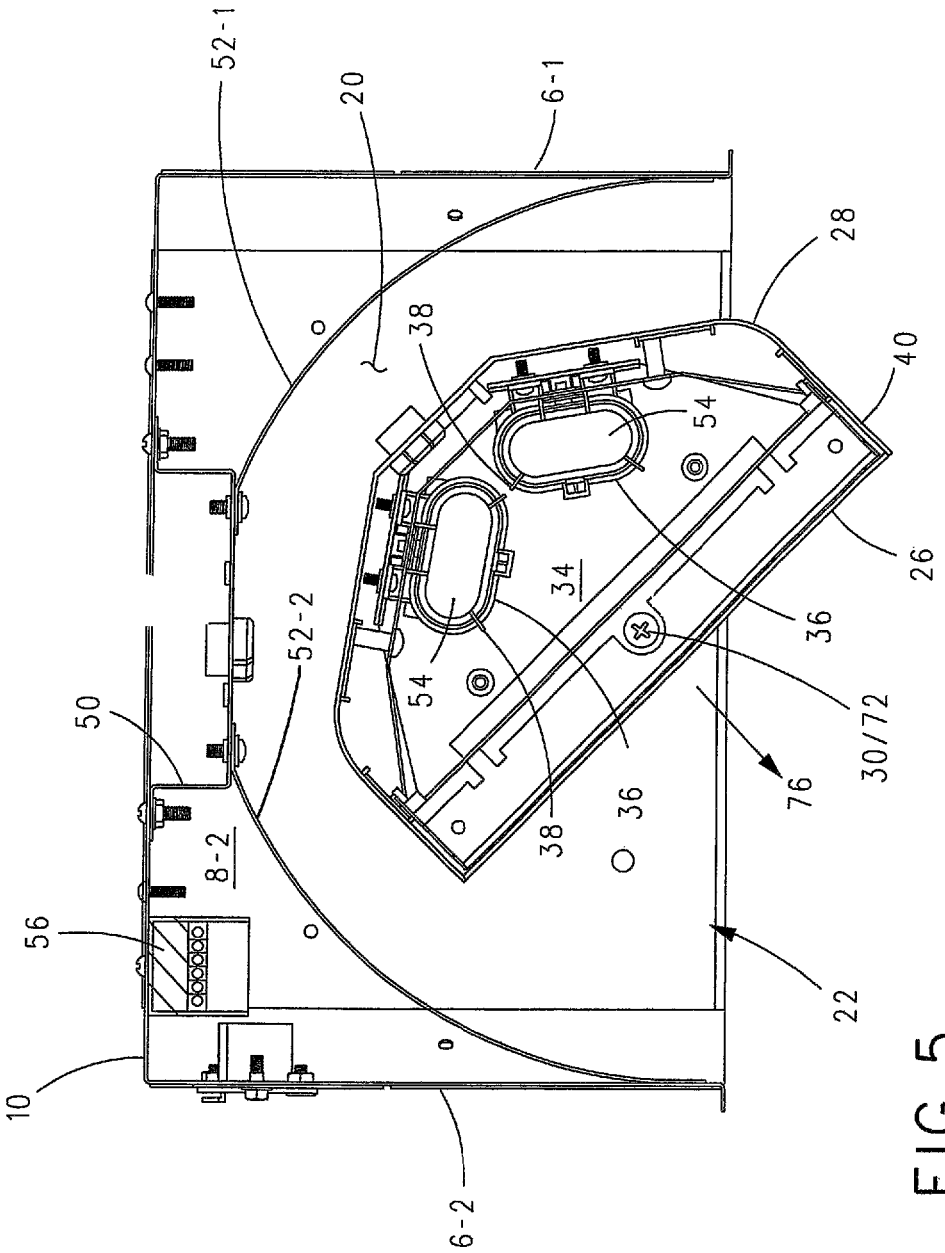


FIG. 4



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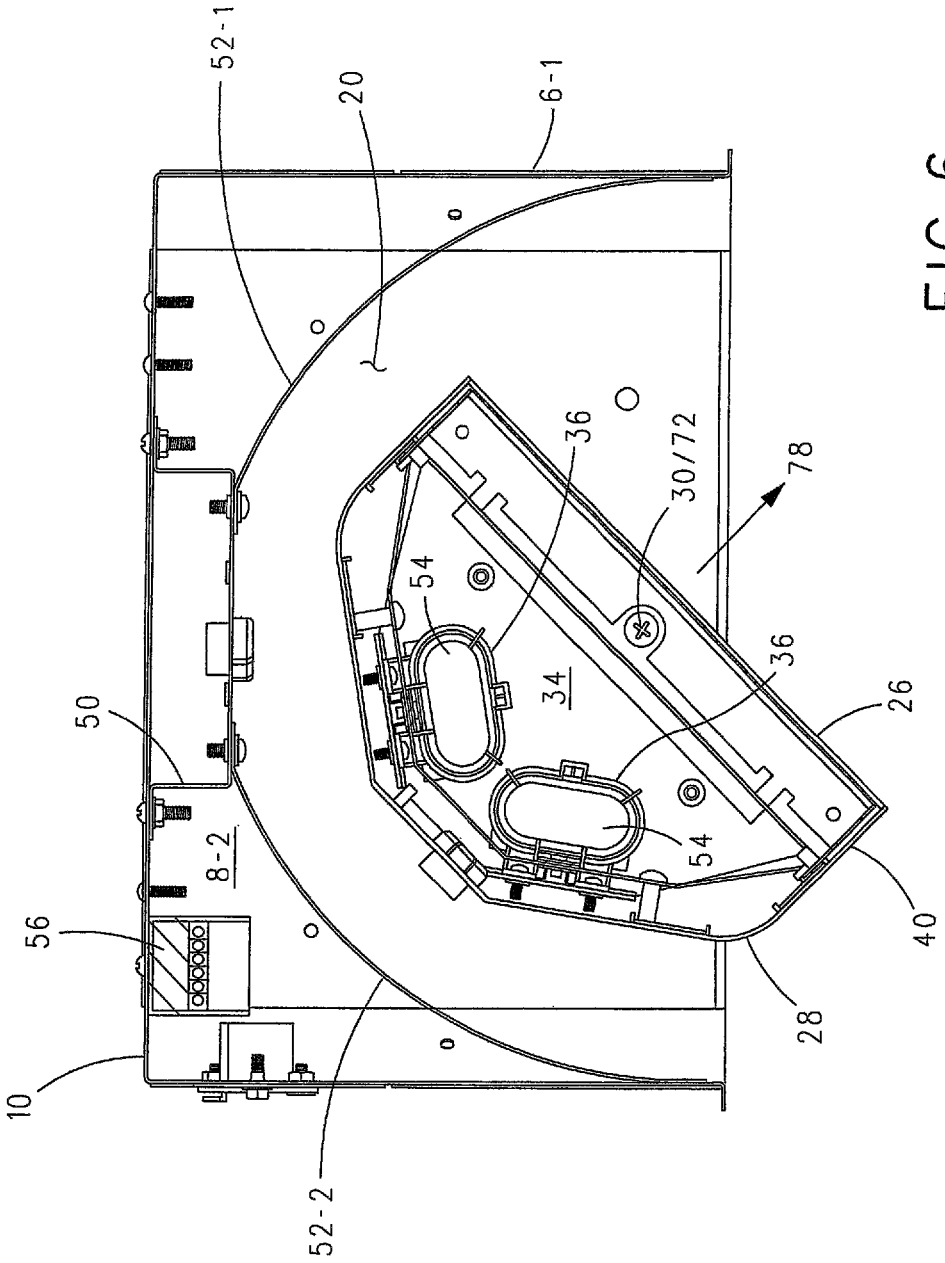


FIG. 6

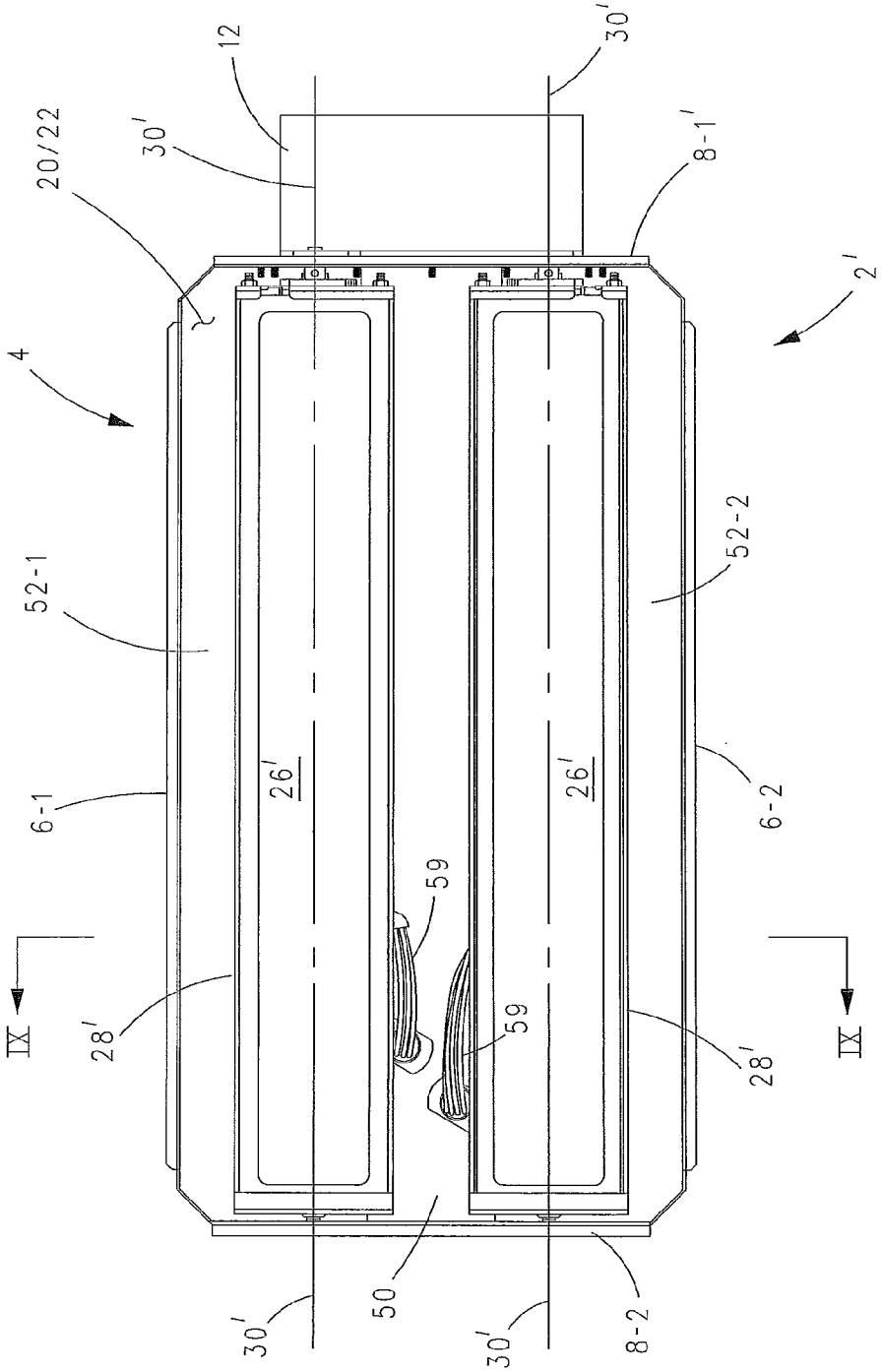
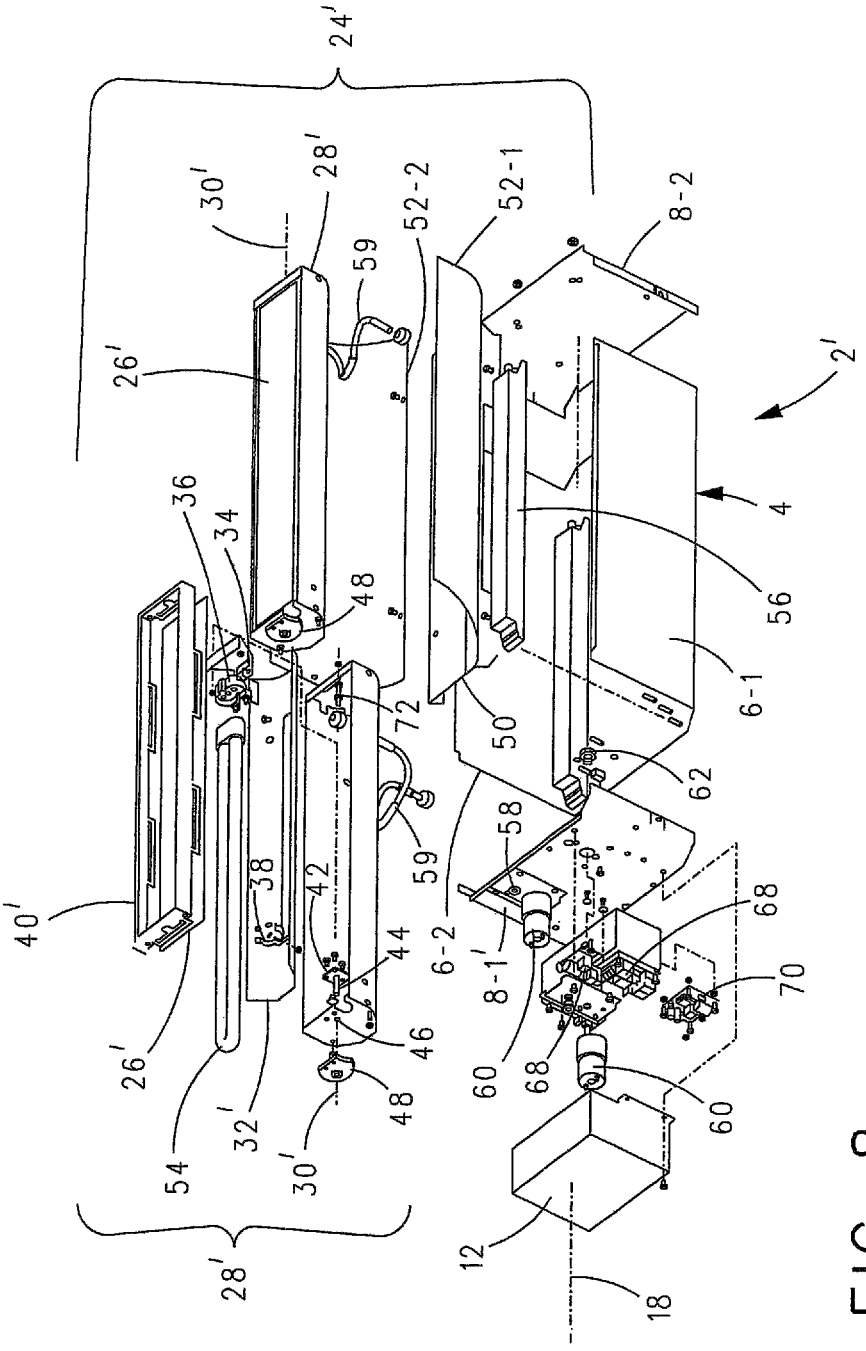


FIG. 7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28'
30'
52-2
52-1
8-2
59
26'
2'
36
34
48
4
56
6-1
72
50
62
58
40'
38
42
59
6-2
68
44
8-1'
70
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60
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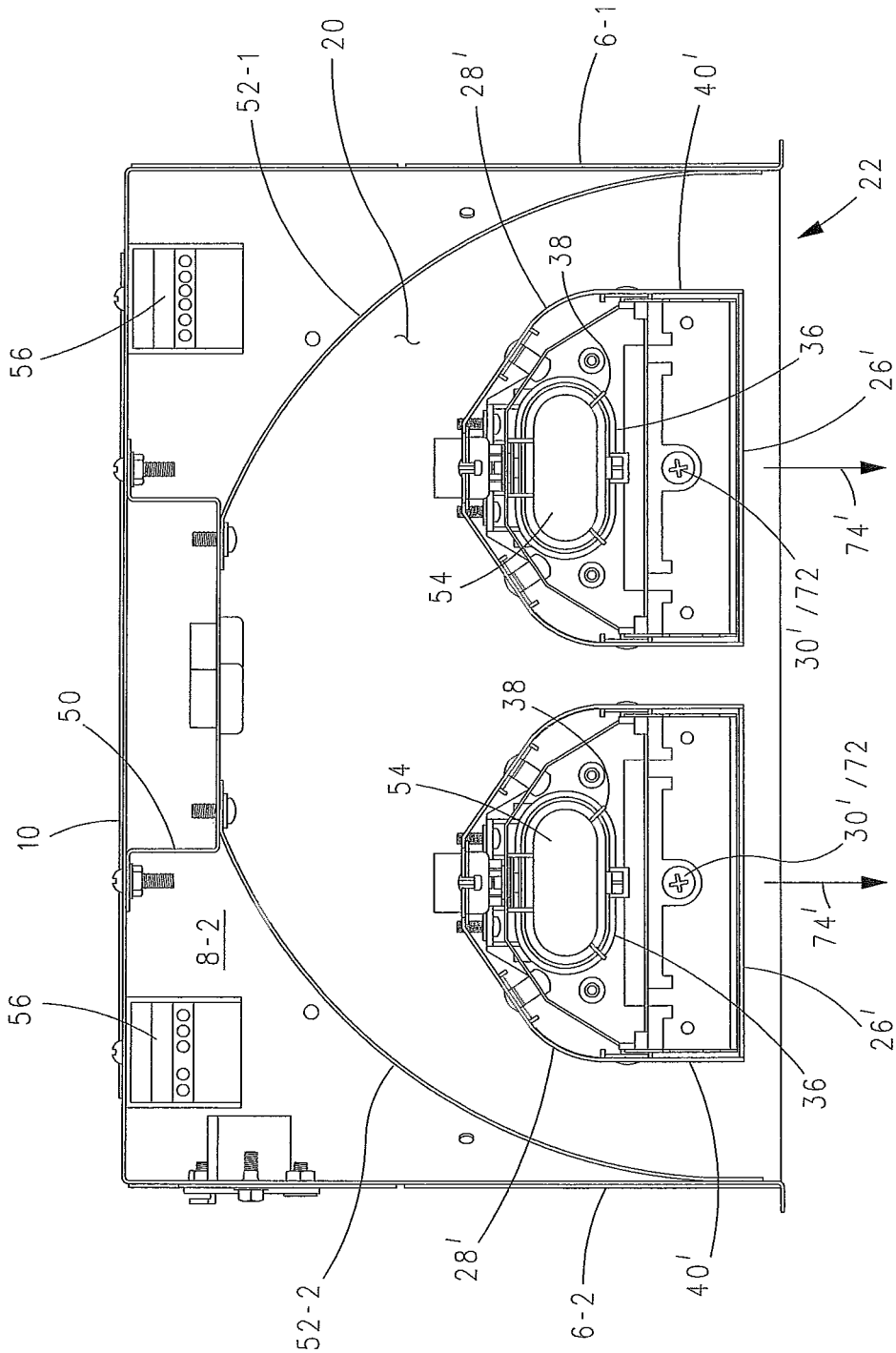
60
48
54
32'
30'
12
28'
18

FIG. 8



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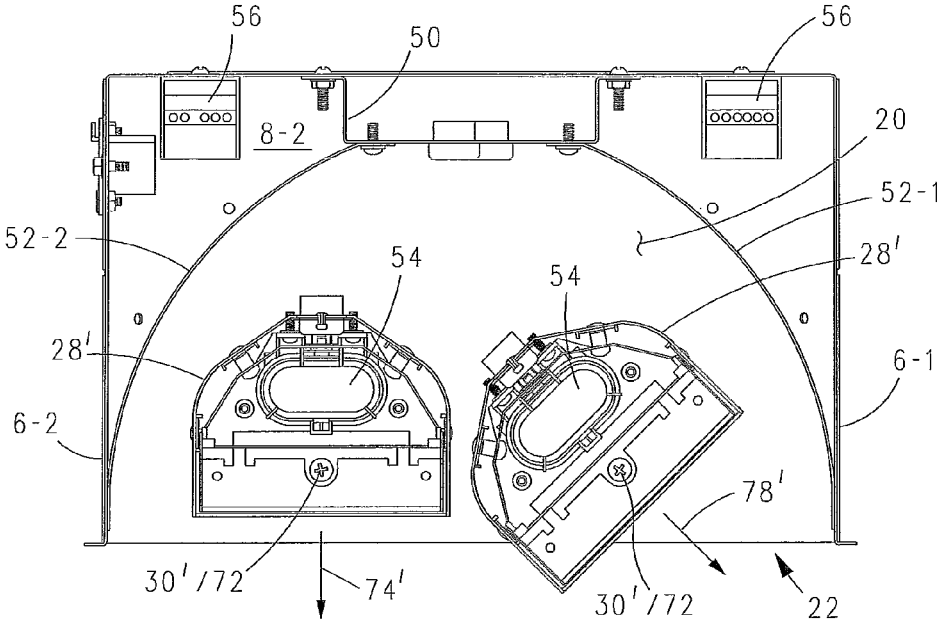
56
50
56
8-2
20
52-1
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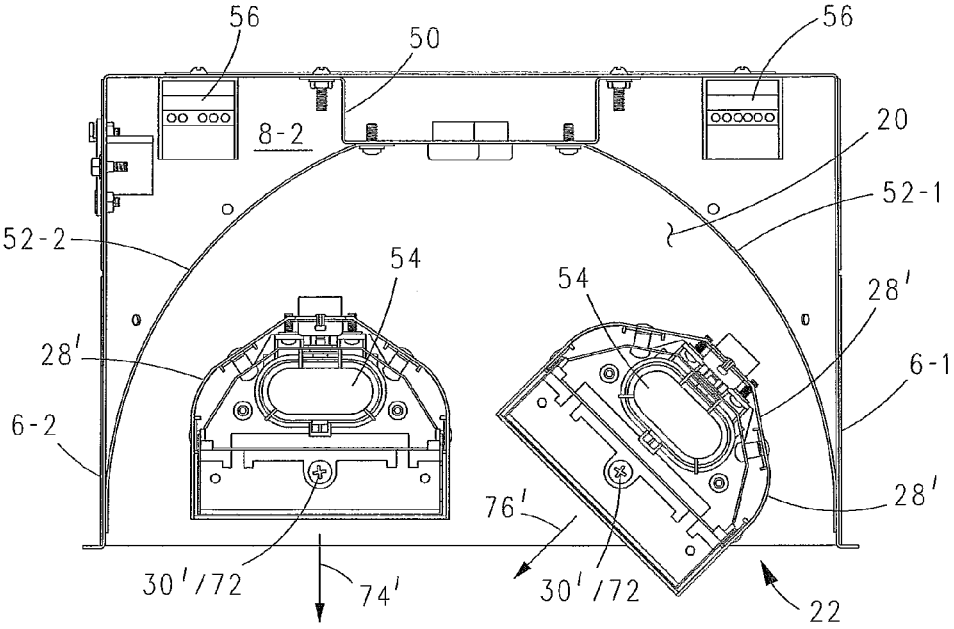
54
28'
28'
6-1
6-2
78'
30'/72
74'
30'/72
22

FIG. 10


56
50
56
8-2
20
52-1
52-2
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54
28'
28'
6-1
6-2
76'
28'
30'/72
74'
30'/72
22

FIG. 11

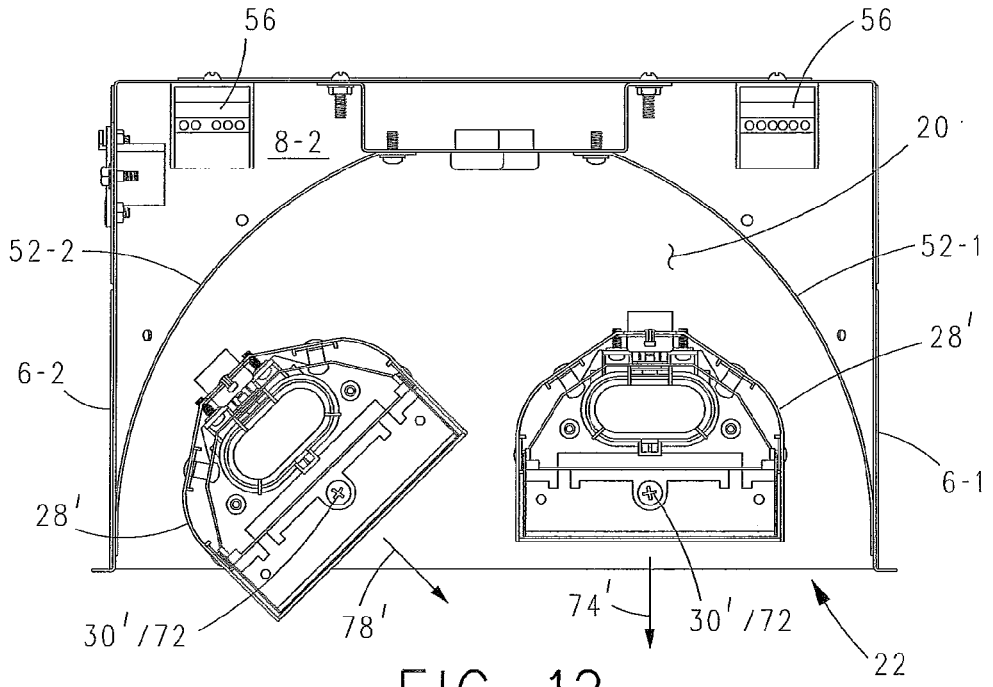
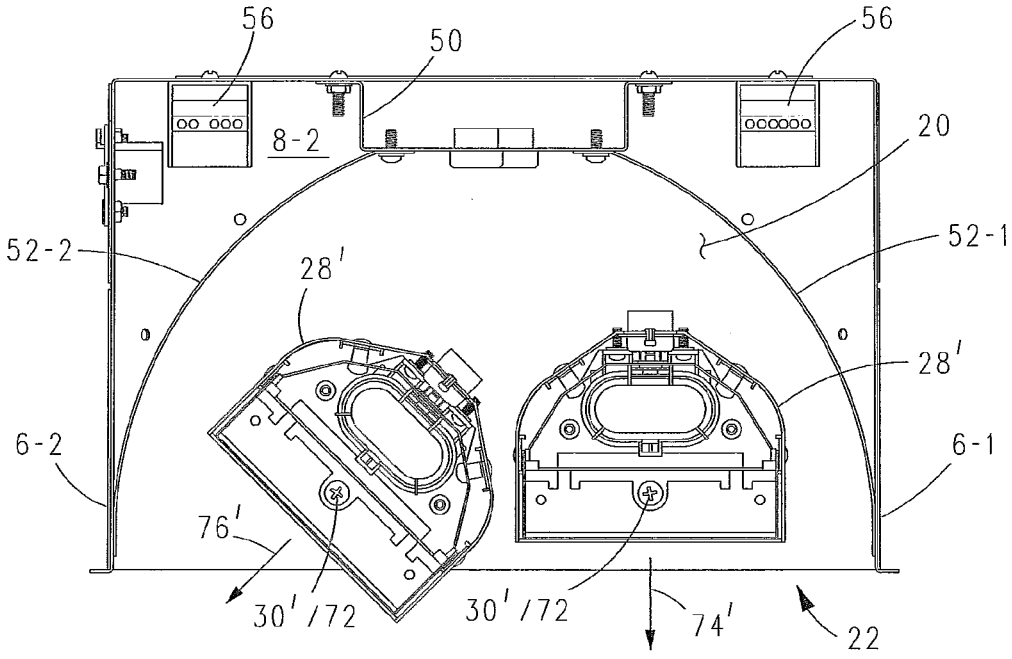

56
56
8-2
20
52-2
52-1
6-2
28'
6-1
28'
78'
74'
30'/72
30'/72
22

FIG. 12


56
50
56
8-2
20
52-2
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28'
28'
6-2
6-1
76'
30'/72
30'/72
74'
22

FIG. 13

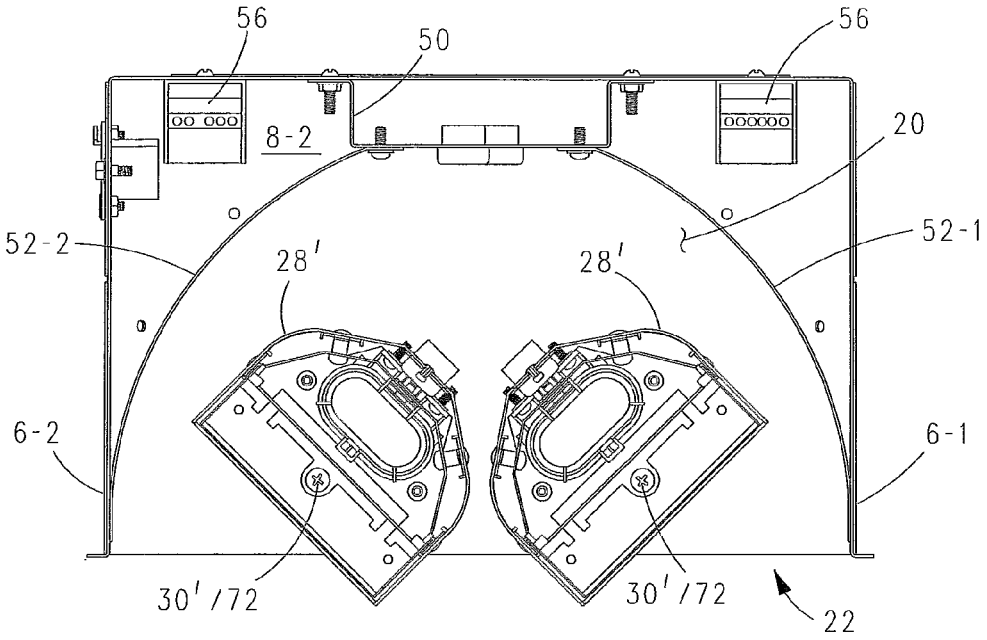

56
50
56
8-2
20
52-2
52-1
28'
28'
6-2
6-1
30'/72
30'/72
22

FIG. 14

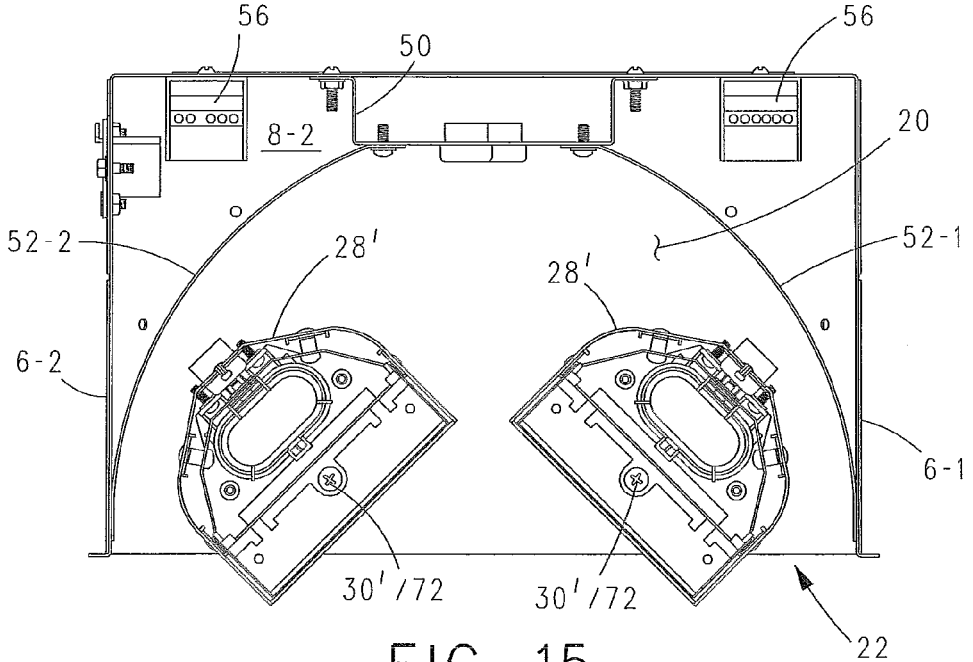

56
50
56
8-2
20
52-2
52-1
28'
28'
6-2
6-1
30'/72
30'/72
22

FIG. 15

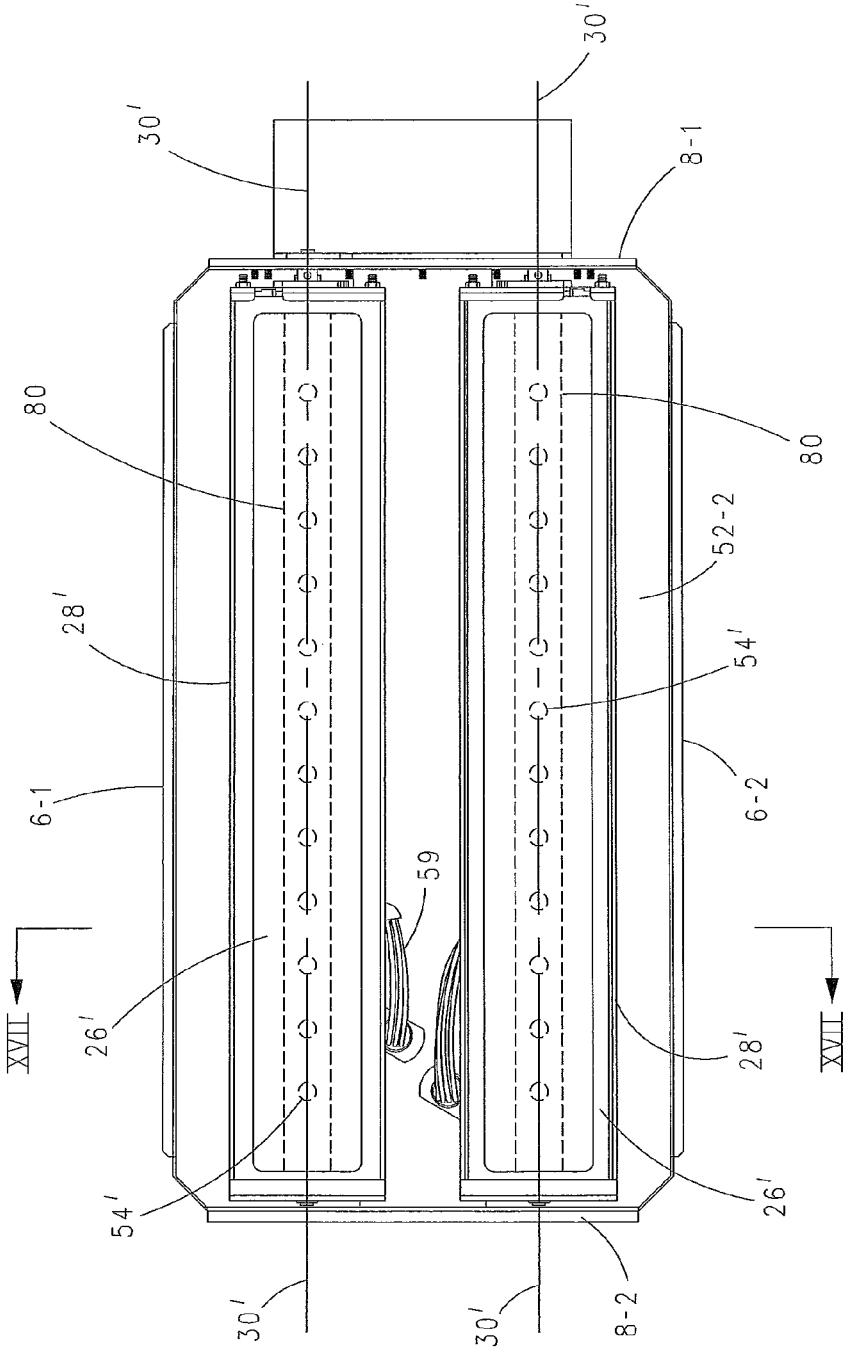


FIG. 16

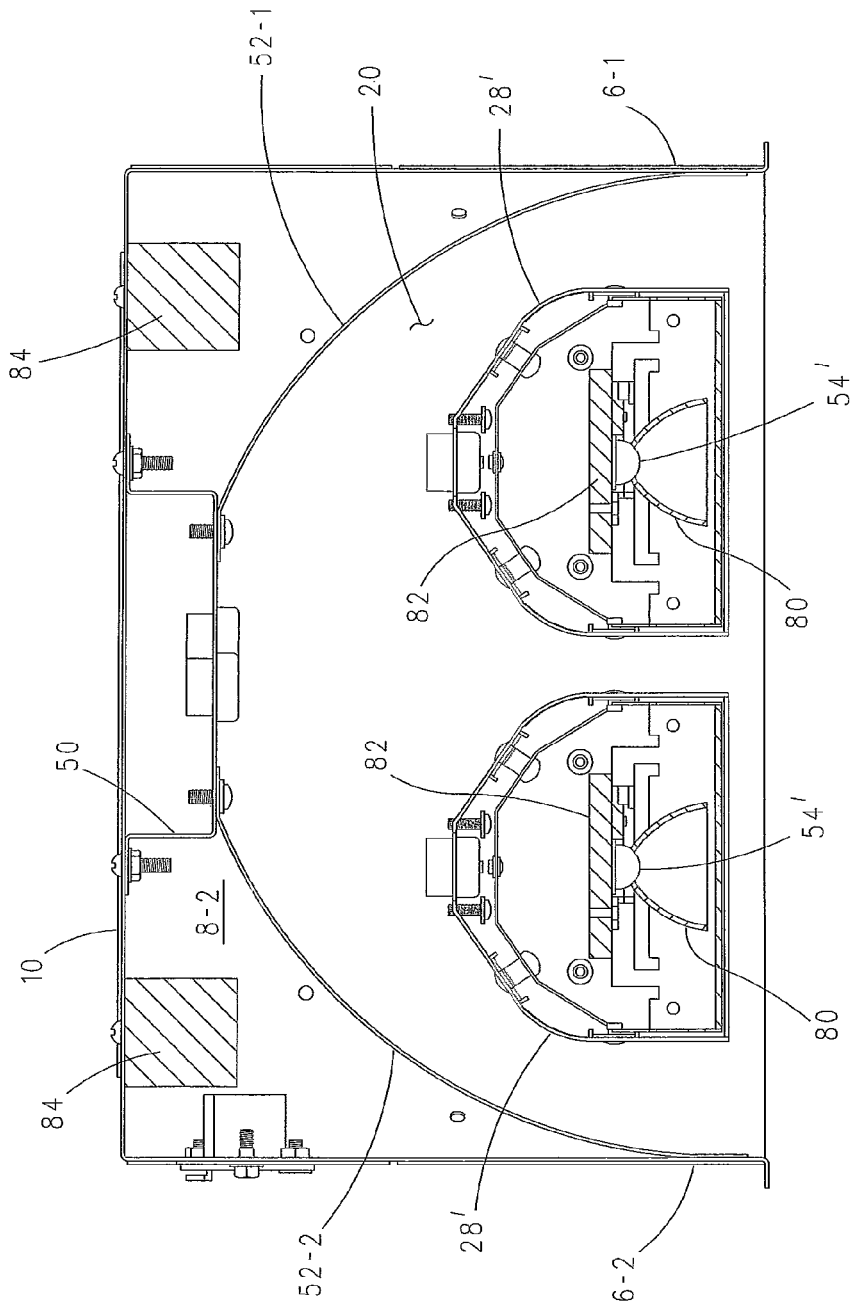


FIG. 17

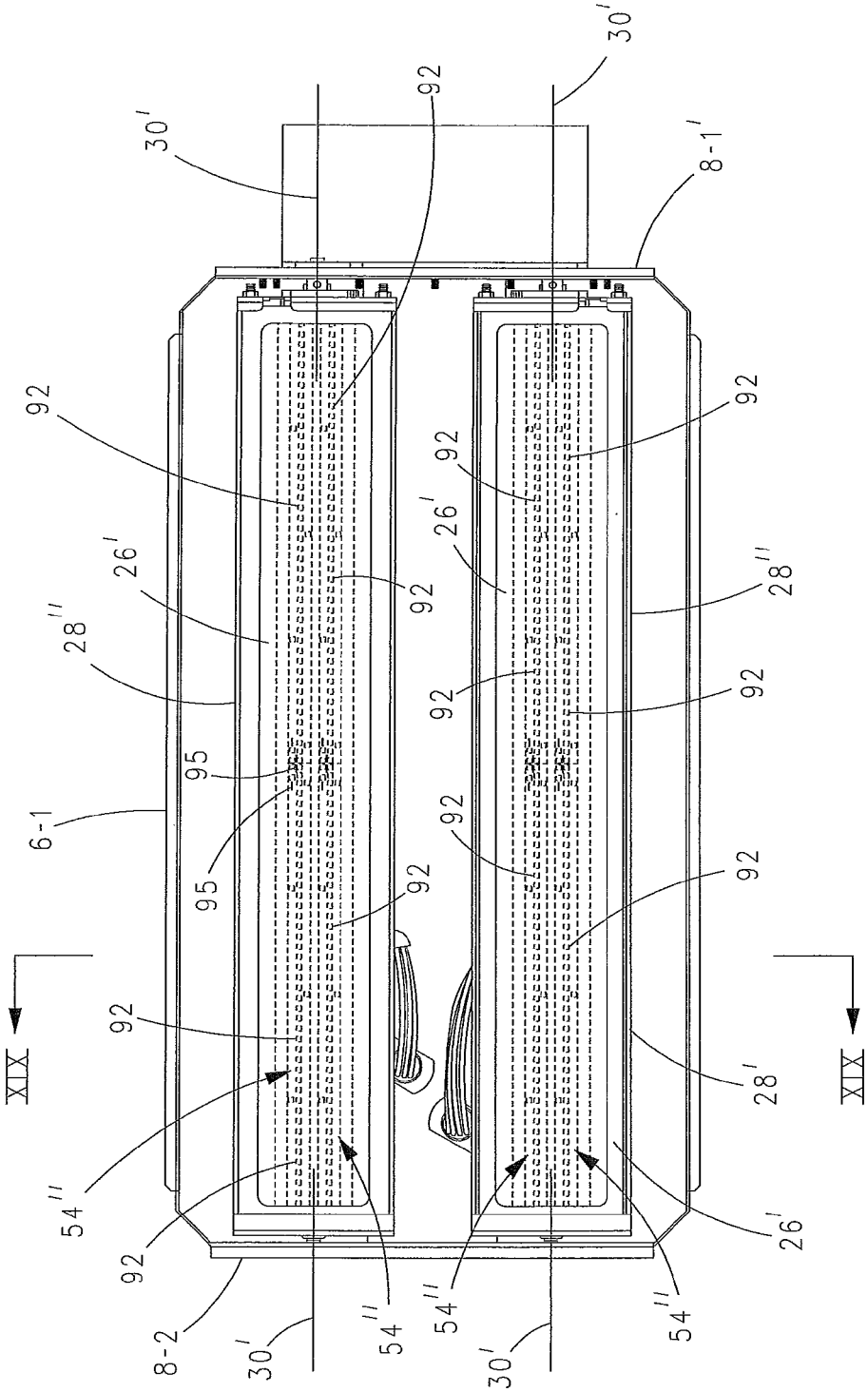
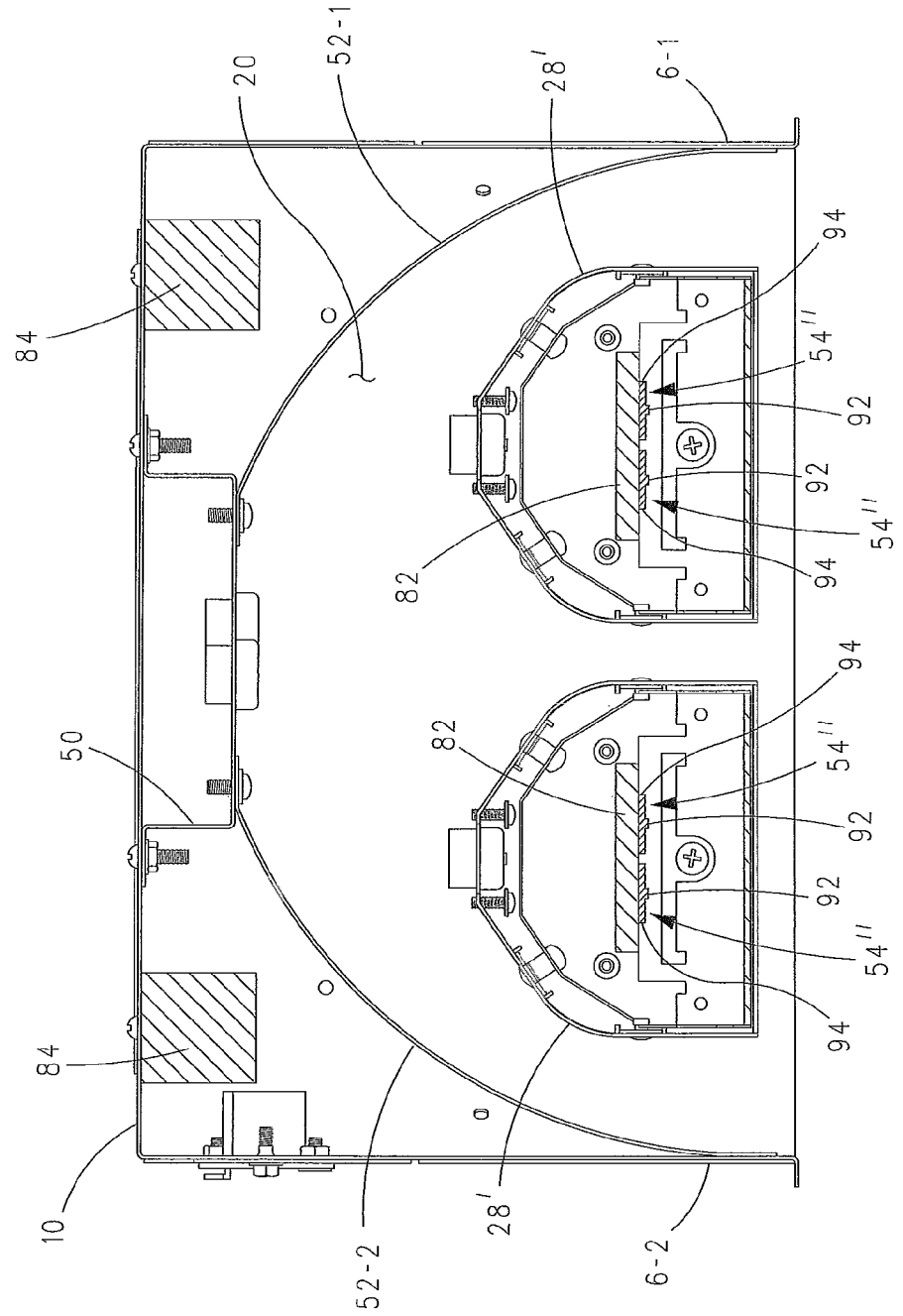

30'
92
30'
8-1'
92
92
92
26'
92
26'
28''
28''
92
92
92
95
6-1
95
92
92
92
92
XIX
XIX
28'
54''
92
26'
92
8-2
30'
54''
54''
54''
30'
30'

FIG. 18


10
84
50
84
20
52-1
52-2
28'
28'
6-1
6-2
82
82
94
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54''
94
94
54''
92
92
54''
94

FIG. 19

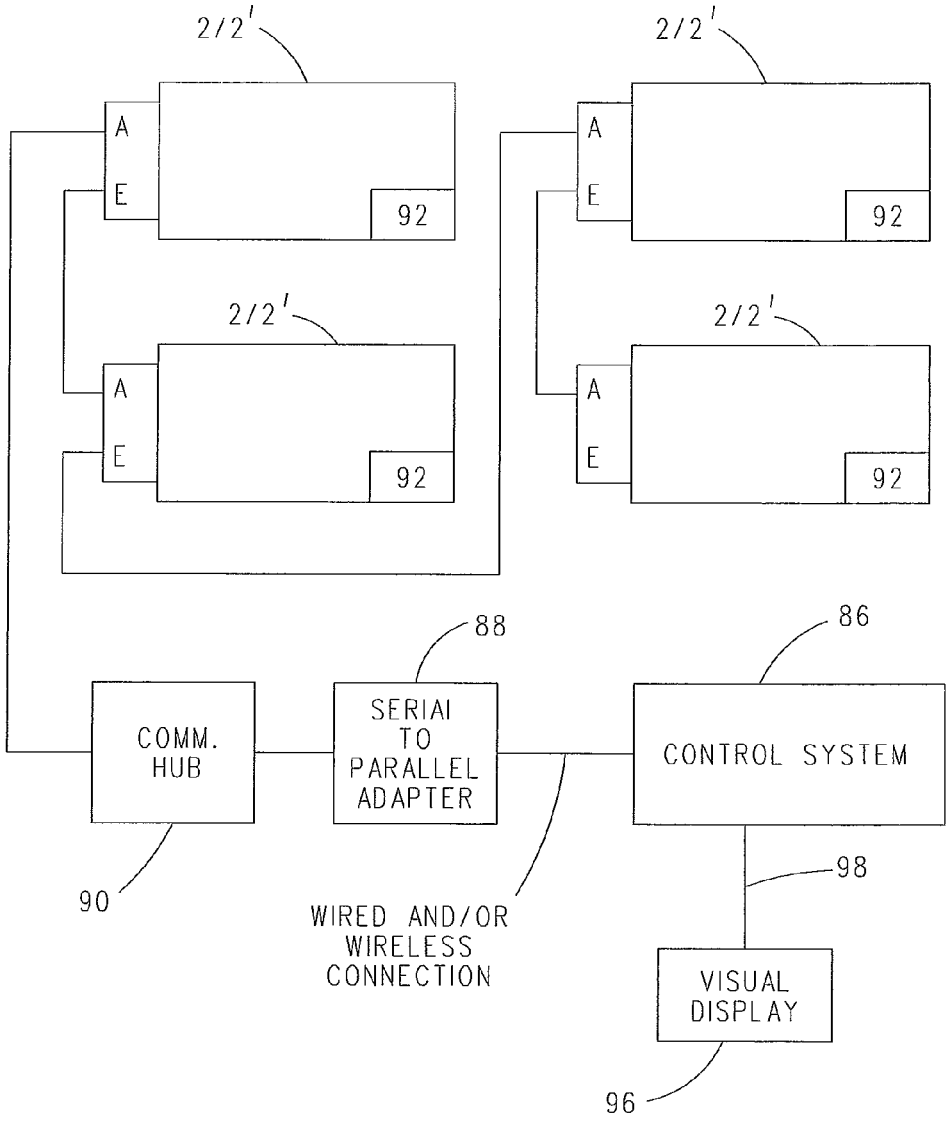
2/2'
2/2'
2/2'
2/2'
A
E
92
A
E
92
A
E
92
A
E
92
88
86
COMM. HUB
SERIAI TO PARALLEL ADAPTER
CONTROL SYSTEM
90
WIRED AND/OR WIRELESS CONNECTION
98
VISUAL DISPLAY
96

FIG. 20

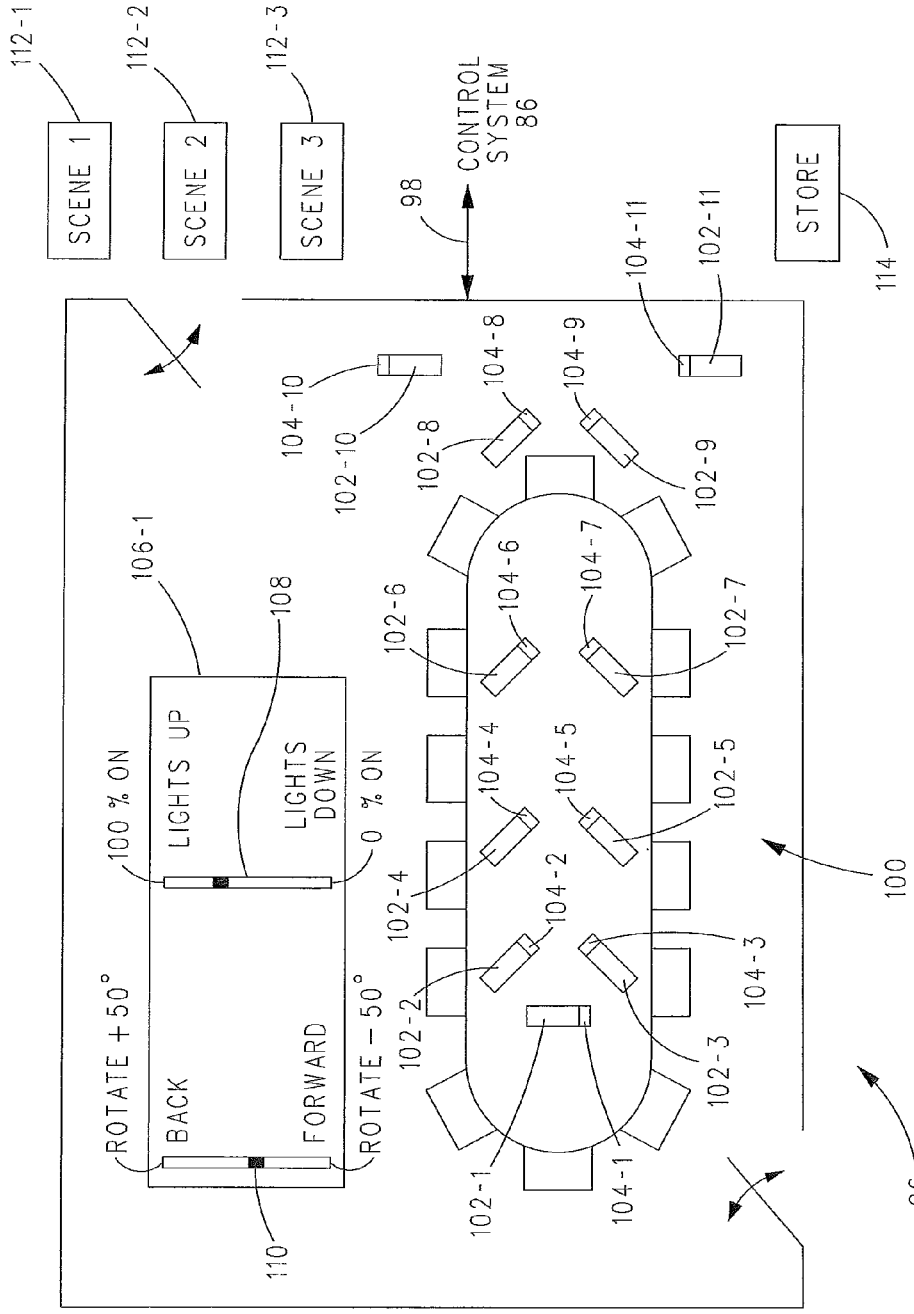
SCENE 1
SCENE 2
SCENE 3
CONTROL SYSTEM 86
STORE
98
112-1
112-2
112-3
114
104-11
102-11
104-10
102-10
104-8
102-8
104-9
102-9
106-1
108
LIGHTS UP
LIGHTS DOWN
100 % ON
0 % ON
ROTATE + 50°
ROTATE − 50°
BACK
FORWARD
110
102-6
104-6
104-7
102-7
104-4
104-5
102-5
102-4
104-2
102-2
104-3
102-3
102-1
104-1
100
96

FIG. 21

MOTORIZED LIGHTING FIXTURE WITH MOTOR AND LIGHT DIMMING CONTROL

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to lighting fixtures for plaster/drywall ceilings and dropped ceilings and, more particularly, to lighting fixtures that include directionally adjustable lighting.

2. Description of Related Art

Dropped ceilings are well known in the art as secondary ceilings that are hung below a main (structural) ceiling. Dropped ceilings are also referred to as a drop ceiling, false ceiling, or suspended ceiling, and are utilized widely in modern construction and architecture.

It is well known in the art for dropped ceilings to include one or more lighting fixtures that are supported by the gridwork of the dropped ceiling in a plenum space defined in the area above the dropped ceiling.

Plaster or drywall ceilings are also known in the art to include one or more lighting fixtures supported in one or more spaces above the ceilings, typically between joists that define the support structure of the plaster or drywall ceiling.

Heretofore, such lighting fixtures were configured to direct light in a single direction into a room below the ceiling. There is, however, a need in certain applications, such as, without limitation, video conferencing, distance learning, telemedicine, internet video streaming, and non-traditional studio environments, where directional control of the light output by a lighting fixture disposed in a ceiling would be desirable.

SUMMARY OF THE INVENTION

The invention is a lighting fixture comprising: an elongated housing (desirably an elongated housing that defines a longitudinal axis); at least one lamp carriage assembly (desirably an elongated lamp carriage assembly) disposed inside the housing and supporting one or more lamps (desirably parallel with the longitudinal axis of the housing); and at least one motor coupled between the housing and the lamp carriage assembly and operative for pivoting the lamp carriage assembly relative to the housing about a pivot axis of the lamp carriage assembly. Desirably, the pivot axis of the lamp carriage assembly runs parallel with the longitudinal axis of the housing.

The motor can be operative for pivoting the lamp carriage assembly under the control of a controller which controls the motor via wired, or wireless, or both wired and wireless communication.

The motor can be operative for pivoting the lamp carriage assembly about its pivot axis in a first direction, a second direction, or both the first and second directions.

Two lamp carriage assemblies can be disposed side-by-side in the housing. Each lamp carriage assembly can be pivotable about its pivot axis in a first direction, a second direction, or both the first and second directions independently of any other lamp carriage assembly. Two motors can be coupled between the two lamp carriage assemblies and the housing, with each motor coupled between one of the lamp carriage assemblies and the housing.

The lighting fixture can further include: a lamp holder coupled to the lamp carriage assembly and supporting the one or more lamps in fixed relation to the lamp carriage assembly; and a reflector disposed in the lamp carriage assembly such that light output by at least one of the one or more lamps is directed by the reflector away from an interior of the lamp carriage assembly.

Each lamp can comprise one of the following: an elongated fluorescent lamp supported by the lamp carriage assembly (desirably with a longitudinal axis of the fluorescent lamp parallel with the longitudinal axis of the housing); and/or a plurality of light emitting diodes (LEDs) supported by the lamp carriage assembly (desirably in a direction along the longitudinal axis of the housing).

At least one of the one or more lamps can be a fluorescent lamp. The lighting fixture can further include a fluorescent lamp ballast disposed in the housing and electrically coupled to the fluorescent lamp.

The housing can be a rectangular box-like structure having an open side. The lamp carriage assembly can support the one or more lamps to output light via the open side of the housing. Desirably, the one or more lamps output light through the open side of the housing via a lens. The lens can be coupled with the lamp carriage assembly and pivot with the lamp carriage assembly in response to the motor pivoting the lamp carriage assembly relative to the housing about the pivot axis of the lamp carriage assembly.

The invention is also a lighting method that utilizes a lighting fixture comprising a housing that desirably defines a longitudinal axis, at least one lamp carriage assembly disposed inside the housing and supporting one or more lamps, desirably parallel with the longitudinal axis of the housing, and at least one motor coupled between the housing and the lamp carriage assembly and operative for pivoting the lamp carriage assembly relative to the housing about a pivot axis of the lamp carriage assembly that desirably runs parallel with the longitudinal axis of the housing. The lighting method comprises: (a) causing a first motor to maintain a first lamp carriage assembly disposed inside the housing in a first position outputting light in response to illumination of the one or more lamps of the first lamp carriage assembly; and (b) following step (a), causing the first motor to pivot the first lamp carriage assembly about its pivot axis thereby redirecting where the light output by the first lamp carriage assembly is directed in response to the illumination of the one or more lamps of the first lamp carriage assembly.

The method can further include (c) causing the first motor to further pivot the first lamp carriage assembly about its pivot axis thereby further redirecting where the light output by first lamp carriage assembly is directed in response to the illumination of the one or more lamps of the first lamp carriage assembly. In step (c), the first lamp carriage assembly can be pivoted back to the first position.

In step (b) or step (c), the lamp carriage assembly can be pivoted about its pivot axis in the clockwise direction or the counterclockwise direction.

The lighting method can further include: (c) causing a second lamp carriage assembly disposed inside the housing to pivot about its pivot axis thereby redirecting where the light output by the second lamp carriage assembly is directed in response to the illumination of the one or more lamps of the second lamp carriage assembly, wherein the second lamp carriage assembly is pivoted in the same or a different direction than the first lamp carriage assembly, and the second lamp carriage is pivoted by the first motor or a second motor.

The invention is also a lighting fixture comprising: a housing defining an axis; a first lamp carriage assembly supported inside the housing for pivoting about a pivot axis of the first lamp carriage assembly that is parallel with the axis of the housing; one or more lamps carried by the first lamp carriage assembly; and a first motor coupled between the housing and

the first lamp carriage assembly and operative for pivoting the first lamp carriage assembly relative to the housing about the pivot axis of the first lamp carriage assembly.

A second lamp carriage assembly can be supported inside the housing for pivoting about a pivot axis of the second lamp carriage assembly that is parallel with the axis of the housing. One or more lamps can be carried by the second lamp carriage assembly. A second motor can be coupled between the housing and the second lamp carriage assembly and operative for pivoting the second lamp carriage assembly relative to the housing about the pivot axis of the second lamp carriage assembly.

Each lamp carriage assembly can be pivoted about its pivot axis in a first direction, a second direction, or both the first and second directions independently of the other lamp carriage assembly.

The lighting fixture can further include a controller for controlling the operation of the first motor, or the second motor, or both the first and the second motors via wired, or wireless, or both wired and wireless communication.

Lastly, the invention is a lighting fixture control method that comprises: (a) providing a control system that is programmed to control a plurality of lighting fixtures, wherein each lighting fixture comprising a housing, at least one lamp carriage assembly disposed inside the housing and supporting one or more lamps, and at least one motor coupled between the housing and the lamp carriage assembly, said motor operative for pivoting the lamp carriage assembly relative to the housing about a pivot axis of the lamp carriage assembly; and (b) the control system receiving an input that causes the control system to (1) activate said motors to pivot the lamp carriage assemblies, (2) adjust the light output by the lamps, or (3) both.

Step (b) can include two or more of the lamp carriage assemblies being pivoted to direct light output by the lamps thereof in the same or different directions.

The method can further include: (c) the control system receiving another input that causes the control system to (1) activate said motors to further pivot the lamp carriage assemblies, (2) further adjust the light output by the lamps, or (3) both.

Adjusting the light output by the lamps in step (b) can include the control system adjusting the output of one or more lamps to be fully on, fully off, or partially on.

Step (b) can include: (b)(1) displaying on a visual display a first icon representing a lighting fixture that is under the control of the control system; (b)(2) in response to selection of the first icon, displaying a second icon on the visual display, wherein the second icon includes a virtual control related to either pivoting of the lamp carriage assembly of the lighting fixture represented by the first icon or an amount of light output by the one or more lamps of the lamp carriage assembly of the lighting fixture represented by the first icon; and (b)(3) adjusting the virtual control whereupon either the lamp carriage assembly of the lighting fixture represented by the first icon pivots or the amount of light output by the one or more lamps of the lamp carriage assembly of the lighting fixture represented by the first icon changes.

Step (b) can include: (b)(1) displaying on a visual display an icon representing a scene; and (b)(2) in response to selecting the icon, the control system controlling each of the plurality of lighting fixtures such that the motor of the lighting fixture pivots the lamp carriage assembly of the lighting fixture to a preprogrammed angle, the light output of the one or more lamps of the lamp carriage assembly of the lighting fixture changes to a preprogrammed percentage light output between 0% and 100%, or both.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a top and two sides of a rectangular box-like housing that can be utilized with the embodiments of the lighting fixture of the present invention described hereinafter;

FIG. **2** is a bottom up view of the housing of FIG. **1** in accordance with one embodiment of the present invention;

FIG. **3** is an exploded perspective view of the housing and the lamp carriage shown in FIG. **2**;

FIG. **4** is a section taken along lines IV-IV in FIG. **2**;

FIG. **5** shows the clockwise rotation of the lamp carriage assembly shown in FIG. **4**;

FIG. **6** shows the counterclockwise rotation of the lamp carriage assembly shown in FIG. **4**;

FIG. **7** is a bottom up view of the housing of FIG. **1** in accordance with another embodiment of the present invention;

FIG. **8** is a partially exploded perspective view of the housing and the lamp carriage shown in FIG. **7**;

FIG. **9** is a cross-section taken along lines IX-IX in FIG. **7**;

FIG. **10** shows the counterclockwise rotation of the right lamp carriage assembly of FIG. **9** while the left lamp carriage assembly remains in its home position;

FIG. **11** shows the clockwise rotation of the right lamp carriage assembly of FIG. **9** while the left lamp carriage assembly remains in the home position;

FIG. **12** shows the counterclockwise rotation of the left lamp carriage assembly of FIG. **9** while the right lamp carriage assembly remains in the home position;

FIG. **13** shows the clockwise rotation of the left lamp carriage assembly of FIG. **9** while the right lamp carriage assembly remains in the home position;

FIG. **14** shows the clockwise and counterclockwise rotations of the left and right lamp carriage assemblies shown in FIG. **9**;

FIG. **15** shows the counterclockwise and clockwise rotations of the left and right lamp carriage assemblies shown in FIG. **9**;

FIG. **16** shows another embodiment of the present invention wherein the lamp is comprised of a number of LEDs;

FIG. **17** is a section taken along lines XVII-XVII in FIG. **16**;

FIG. **18** shows another embodiment of the present invention where the lamp is comprised of one or more LED strips;

FIG. **19** is a section taken along XIX-XIX in FIG. **18**;

FIG. **20** is a schematic diagram of a control system for controlling the rotation of a number of lamp carriage assemblies and/or the amount of light output by the lamps thereof of a number of different lighting fixtures in accordance with the present invention; and

FIG. **21** is an illustration of a number of lighting fixtures displayed by the control system of FIG. **20** on the visual display of FIG. **20**, including for each lighting fixture an icon and a status block, and further illustrating a virtual control panel including virtual slides, scene icons and a store icon produced on the visual display of FIG. **20** under the control of the software program controlling the control system of FIG. **20**.

DESCRIPTION OF THE PREFERRED EMBODIMENTS

The present invention will be described with reference to the accompanying figures where like reference numbers correspond to like elements.

The present invention is directed to a lighting fixture that is configured to be mounted above a ceiling.

With reference to FIG. **1**, a first embodiment lighting fixture **2** includes a housing **4** in the form of a rectangular box-like structure that includes a pair of sides **6-1** and **6-2** held in spaced relation by a pair of spaced ends **8-1** and **8-2**. An optional top **10** can cover the top edges of sides **6-1** and **6-2** and ends **8-1** and **8-2**.

An optional housing **12** can be coupled to any side or end of housing **4** of lighting fixture **2** to act as a dust and protective cover for one or more motors, one or more motor control circuits, and/or an AC-to-DC power supply to be described hereinafter.

In the embodiment of lighting fixture **2** shown in FIG. **1**, the length **14** of sides **6** is longer than the length **16** of ends **8**. However, this is not to be construed as limiting the invention since it is envisioned that the lengths **14** of sides **6** and the lengths **16** of ends **8** can be any suitable and/or desirable length. In the embodiment of lighting fixture **2** shown in FIG. **1**, housing **4** defines a longitudinal axis **18** that extends through ends **8-1** and **8-2**.

With reference to FIG. **2** and with continuing reference to FIG. **1**, in accordance with the first embodiment, housing **4** includes in an interior **20** thereof visible through an opening **22** in the bottom of housing **4** a single lamp carriage **24** that includes a lens **26** that faces away from optional top **10** of housing **4**.

With reference to FIG. **3** and with continuing reference to FIGS. **1** and **2**, lamp carriage **24** includes a lamp carriage assembly **28** that defines a pivot axis **30**, described in detail hereinafter, which runs parallel with longitudinal axis **18** of housing **4** when lamp carriage **24** is mounted in an assembled state into interior **20** of housing **4**.

Lamp carriage **24** includes a reflector **32** and an end plate **34** coupled to lamp carriage assembly **28**. End plate **34** supports at least one lamp holder **36**. At least one lamp support **38** is affixed to reflector **32** adjacent an end thereof opposite lamp holder **36**. Lamp carriage **24** further includes a lens frame **40** coupled to lamp carriage assembly **28** and configured to support lens **26** spaced from reflector **32**. Lamp carriage **24** also includes a pivot bracket **42** that includes a shaft **44** that projects through a hole **46** in an end of lamp carriage assembly **28**. Pivot bracket **42** is affixed to the end of lamp carriage assembly **28** so that shaft **44** does not rotate. A gear **48** is fixedly coupled for non-rotation to the portion of shaft **44** that projects through hole **46** in the end of lamp carriage assembly **28**.

Lamp carriage **24** further includes a housing cover **50** which is coupled to top **10** and a pair of housing dome inserts **52-1** and **52-2** that co-act with housing cover **50** to form a dome-shaped structure in the interior **20** of lighting fixture **2** wherein lamp carriage assembly **28** is held for rotation (described hereinafter) within said dome-shaped structure.

In use of lighting fixture **2**, each lamp holder **36** is mated with the mating electrical connection end of a lamp **54**. Each lamp holder **36** and lamp **54** has mating connectors that enable electrical power to be supplied to lamp **54** via lamp holder **36** in a manner known in the art. While FIG. **3** shows lamp **54** as being in the form of a fluorescent lamp, this is not to be construed as limiting the invention since it is envisioned that lamp **54** in the form of a fluorescent lamp can be replaced with a plurality of LEDs that perform the same function. The end of lamp **54** opposite lamp holder **36** is held in place by lamp support **38** whereupon lamp **54** is held in fixed relation within lamp carriage assembly **28**.

Where each lamp **54** is a fluorescent lamp, lighting fixture **2** includes a fluorescent lamp ballast **56** coupled to top **10** in a space defined between top **10** and one of the housing dome inserts **52**. Ballast **56** is coupled to one or more lamp holders **36** via suitable electrical wiring **59** that facilitates the supply of electrical power from ballast **56** to each lamp **54** that is plugged into a lamp holder **36**.

The end of shaft **44** that extends through gear **48** is received for rotation in a non-rotating bushing **58** supported by side **8-1** of housing **4**. The end of lamp carriage assembly **28** opposite gear **48** is pivotally secured to end **8-2** in any suitable or desirable manner that enables lamp carriage assembly **28** to pivot about pivot axis **30** in a manner to be described hereinafter.

A motor **60** is coupled to gear **48** via a meshing gear **62** which is coupled to a shaft **64** of motor **60** for rotation therewith. Motor **60** can be fixedly supported to end **8-1** of housing **4** by any suitable and/or desirable means, such as, without limitation, a bracket **66**. In one embodiment, motor **60** is coupled to an output of a motor control unit **68** which can be controlled to controllably rotate shaft **64** and, hence, gear **62** in a clockwise or counterclockwise direction. Motor control unit **68** is coupled to receive electrical power from an AC-to-DC power supply **70** which is operative for converting incoming AC electrical power into DC electrical power that motor control unit **68** can utilize to controllably rotate shaft **64** of motor **60** in a clockwise direction, or a counterclockwise direction, or both clockwise and counterclockwise directions as deemed suitable and/or desirable. Motor **60**, motor control unit **68**, and power supply **70** are desirably mounted to side **8-1** of housing **4** in any suitable and/or desirable manner, and housing **12** is coupled to side **8-1** of housing **4** covering motor **60**, motor control unit **68**, and power supply **70**.

With reference to FIG. **4** and with continuing reference to FIGS. **1-3**, the end of lamp carriage assembly **28** opposite gear **48** pivots about a pivot **72** through which pivot axis **30** passes. FIG. **4** shows lamp carriage **24** in a "home" position where light output by lamp carriage **24** in response to illuminating each lamp **54** thereof is generally directed in the direction shown by arrow **74**. In response to motor **60** receiving suitable electrical power from motor control unit **68**, motor **60** can cause lamp carriage **24** to rotate from the home position shown in FIG. **4** in a clockwise direction to, for example, the position shown in FIG. **5** where light output by lamp carriage **24** in response to illumination of each lamp **54** thereof is directed generally in the direction shown by arrow **76**. Also or alternatively, motor **60** can be controlled by motor control unit **68** to cause lamp carriage **24** to rotate in a counterclockwise direction to, for example, without limitation, the position shown in FIG. **6** where light output by lamp carriage **24** in response to illumination of each lamp **54** thereof is directed generally in the direction shown by arrow **78**.

With reference to FIGS. **7** and **8** and with continuing reference to FIGS. **1-6**, in another embodiment lighting fixture **2'**, the single lamp carriage assembly **28** shown in FIGS. **2-6** can be replaced with two lamp carriages **28'** disposed side-by-side in housing **4** in the manner shown in FIGS. **7** and **8** to form lamp carriage **24'**.

Differences between lamp carriage assembly **28** shown in FIG. **3** and each lamp carriage assembly **28'** shown in FIG. **8** can optionally include: each lamp carriage assembly **28'** and its corresponding reflector **32'**, lens frame **40'**, and lens **26'** can be narrower than the counterpart components **28**, **32**, **40**, and **26** shown in FIG. **3**; and each lamp carriage assembly **28'** can carry a single lamp **54** versus the plurality, e.g., two, lamps **54** carried by lamp carriage assembly **28** shown in FIG. **3**. However, it is envisioned that lamp carriage assembly **28** shown in FIG. **3** can alternatively carry a single lamp **54** instead of the two lamps **54** illustrated.

In the embodiment shown in FIGS. **7** and **8**, each lamp carriage assembly **28'** is coupled to its own motor **60** via its own gears **48** and **62** for independent rotation of said lamp carriage assembly **28'** about its pivot axis **30'**. Hence, each lamp carriage assembly **28'** is independently rotatable about its pivot axis **30'** via its respective motor **60**. Alternatively, the pair of lamp carriage assemblies **28'** shown in FIG. **8** can be coupled to a single motor **60** in a manner (not shown) that enables both lamp carriage assemblies **28'** to be rotated together in the same direction or opposite directions about their respective pivot axes **30'**.

As shown in FIG. **8**, end **8-1'** is different than end **8-1** in FIG. **3** to facilitate mounting of two motors **60** and two motor control units **68** thereto. Power supply **70** can be provided for supplying power to both motor control units **68**. Housing **12** can be attached to end **8-1'** to cover both motors **60**, both motor control units **68**, and power supply **70**. Lighting fixture **2'** shown in FIG. **8** can also include a pair of ballasts **56**, with each ballast **56** coupled to one of the lamps **54** in one of the lamp carriage assemblies **28'**. Alternatively, a single ballast **56** can be coupled to the lamps **54** in both of the lamp carriage assemblies **28'**.

With reference to FIG. **9** and with continuing reference to FIGS. **7** and **8**, under the control of their respective motors **60**, each lamp carriage assembly **28'** can be positioned in its "home" position shown in FIG. **9** wherein light output by each lamp carriage assembly **28'** in response to illumination of the corresponding lamp **54** travels generally in a direction shown by arrows **74'**. Each lamp carriage assembly **28'** is rotatable by its corresponding motor **60** about its pivot axis **30'**. The pivot axis **30'** of each lamp carriage assembly **28'** is defined by the shaft **44** of one of the pivot brackets **42** installed in one of the bushings **58** and the pivot point **72**, which can be any suitable and/or desirable arrangement that enables said lamp carriage assembly **28'** to pivot about its pivot axis **30'**.

With reference to FIGS. **10-15** and with continuing reference to FIG. **9**, under the control of its respective motor **60**, each lamp carriage assembly **28'** can be independently pivoted about its pivot axis **30'**. For example, as shown in FIG. **10**, under control of the motor **60** coupled thereto, the right lamp carriage assembly **28'** can be rotated counterclockwise about its pivot axis **30'**, to output light generally in the direction shown by arrow **7**R' in response to illumination of lamp **54** thereof, while the motor **60** associated with the left lamp carriage assembly **28'** can be controlled whereupon said left lamp carriage assembly **28'** is in the home position outputting light generally in the direction shown by arrow **74'** in response to illumination of lamp **54** thereof.

As shown in FIG. **11**, the motor **60** coupled to the right lamp carriage assembly **28'** can be controlled to rotate said lamp carriage assembly **28'** clockwise about its pivot axis **30'** to output light generally in the direction shown by arrow **76'** in response to illumination of lamp **54** thereof. At the same time, the motor **60** coupled to the left lamp carriage assembly **28'** of FIG. **11** can be controlled whereupon said left lamp carriage assembly **28'** is in the home position outputting light in the direction shown by arrow **74'** in response to illumination of lamp **54** thereof.

FIGS. **12** and **13** illustrate the rotation of the left lamp carriage assembly **28'** counterclockwise and clockwise about its pivot axis **30'** to output light generally in the directions shown by arrows **78'** and **76'**, respectively, while, at the same time, the right lamp carriage assembly **28'** is maintained in its home position to output light generally in the direction shown by arrow **74'**. In FIGS. **12** and **13**, the counterclockwise and clockwise rotation of the left lamp carriage assembly **28'** is under the control of the motor **60** coupled thereto and the right lamp carriage assembly **28'** is maintained in its home position under the control of the motor **60** coupled thereto.

FIG. **14** illustrates the rotation of the left and right lamp carriage assemblies **28'** clockwise and counterclockwise, respectively, about their respective pivot axes **30'** by their respective motors **60**.

Lastly, FIG. **15** illustrates the rotation of the left and right lamp carriage assemblies **28'** counterclockwise and clockwise, respectively, about their respective pivot axes **30'** by their respective motors **60**.

As can be seen from FIGS. **9-15**, each lamp carriage assembly **28'** can, under the control of its respective motor **60**, be rotated clockwise, counterclockwise, or both clockwise and counterclockwise, independent of the rotation of the other lamp carriage assembly **28'**. While not shown, the left and right lamp carriage assemblies **28'** shown in FIGS. **9-15** can be pivoted or rotated by their respective motors **60** in the same direction so that the light output by both of said lamp carriage assemblies **28'** is directed generally in the direction shown by arrow **74'**, arrow **76'**, or arrow **78'** in FIGS. **9-15**.

Desirably, each motor **60** can rotate the lamp carriage assembly **28** or **28'** coupled thereto to any suitable and/or desirable position about its respective pivot axis **30** or **30'**. For example, the motor **60** coupled to lamp carriage assembly **28** shown in FIG. **4** is capable of rotating said lamp carriage assembly **28** to any fixed angular rotation position about pivot axis **30** subject to the length of electrical wiring **59** coupled between housing cover **50** and lamp carriage assembly **28**. Absent electrical wiring **59**, it is conceivable that the motor **60** coupled to lamp carriage assembly **28** can rotate said lamp carriage assembly **28** to any suitable and/or desirable position about pivot axis **30**. However, in practice, the maximum clockwise or counterclockwise rotation of lamp carriage assembly **28** about pivot axis **30** is limited to no more than about ±50 degrees clockwise or counterclockwise from the home position. Similar comments apply in respect of the rotation of each lamp carriage assembly **28'** shown in FIGS. **7-15**.

With reference to FIGS. **16** and **17**, each lamp **54** in the form of a fluorescent lamp can be replaced with a plurality lamps **54'**, each in the form of a light emitting diodes (LED) disposed along the length of pivot axis **30** or **30'**, as the case may be. For example, FIG. **16** shows a plurality of lamps **54'**, in the form of LEDs, in replacement of each lamp **54**, in the form of a fluorescent lamp, shown in FIG. **8**. Hereinafter, reference number **54'** may be used interchangeable with lamps **54'** and LED(s) **54'**.

Each lamp carriage assembly **28'** shown in FIGS. **16** and **17** includes a single, elongated reflector **80** (shown in phantom) disposed about LEDs **54'** to reflect light output thereby in a desired direction. Alternatively, each lamp carriage assembly **28'** can include two or more reflectors (not shown) with each reflector associated with one or more, but less than the total number of LEDs **54'** of said lamp carriage assembly **28'**. Hence, each lamp carriage assembly **28'** can include anywhere between a single reflector **80** for all of the LEDs **54'** and one reflector per LED **54'** as deemed suitable and/or desirable. Desirably, each LED **54'** of each lamp carriage assembly **28'** is coupled to a heat sink **82** disposed on a side of the LED **54'** opposite reflector **80** to dissipate heat generated by the LED **54'**. Each LED **54'** can be coupled to its own heat sink **82** or two or more (including all) of the LEDs **54'** can be coupled to a single heat sink **82** which extends along the length of pivot axis **30'** of lamp carriage assembly **28'**.

Since lamps in the form of LEDs **54'** operate off DC current, the ballasts **56** shown in, for example, FIGS. **3** and **8** can be replaced with one or more AC-to-DC power supplies **84**

which are coupled to receive incoming AC power and to convert said AC power into DC power of a suitable voltage for the operation of each lamp **54'** in the form of an LED.

Since the operation of each lamp carriage assembly **28'** to pivot about its pivot axis **30'** is the same as is shown in and discussed above in connection with the embodiment shown in FIGS. **8-15**, the independent pivoting, clockwise and/or counterclockwise, of each lamp carriage assembly **28'** which includes lamps **54'** in the form of LEDs will not be described herein to avoid unnecessary redundancy.

While the use of lamps **54'** in the form of LEDs has been described with reference to an embodiment of a light fixture **2** that includes two lamp carriage assemblies **28'**, it is to be appreciated that each lamp **54**, its associated mounting hardware **36** and **38**, and ballast **56** in the embodiment of FIG. **3** can be replaced by a number of lamps **54'** in the form of LEDs including one or more reflectors **80**, one or more heat sinks **82** and one or more AC-to-DC power supplies **84** of the type shown in connection with FIGS. **16** and **17**. Hence, the disclosure herein of any particular type or form of lamp is not to be construed as limiting the invention.

With reference to FIGS. **18** and **19** and with continuing reference to FIGS. **16** and **17**, instead of replacing each lamp **54** in the form of a fluorescent lamp with a plurality of lamps **54'** in the form of standalone LEDs, each fluorescent lamp **54** can be replaced by one or more lamps **54"** in the form of LED strips. Hereinafter, reference number **54"** may be used interchangeable with lamps **54"** and LED strip(s) **54"**.

Each LED strip **54"** includes a plurality of LEDs **92** disposed on a rigid or flexible substrate **94** which desirably includes a suitable pattern of integral electrical conductors (not illustrated) to provide electrical power from an AC-to-DC power supply **84** to each of the LEDs **92** disposed on said substrate **94**. In each of the LED strips **54"** shown in FIGS. **18** and **19**, a plurality of LEDs **92** is arranged in a single line that runs parallel with a longitudinal axis of pivot axis **30'** of lamp carriage assembly **28"**. However, this is not to be construed as limiting the invention since it is envisioned that LEDs **92** of each LED strip **54"** can be arranged in any suitable and/or desirable pattern.

In use thereof, the side of each LED strip **54"** opposite LEDs **92** is coupled directly or indirectly to heat sink **82** which acts to dissipate heat generated by LEDs **92** during the operation thereof to generate light in response to receiving DC power from an AC-to-DC power supply **84**.

Each LED strip **54"** can run the complete or partial length of lamp carriage assembly **28"**. Alternatively, two or more LED strips **54"** can be positioned end-to-end along the length of lamp carriage assembly **28"**. LED strips **54"** arranged in end-to-end relationship can be connected in any suitable or desirable manner that facilitates each said LED strip **54"** receiving electrical power from AC-to-DC power supply **84**. For example, FIG. **18** includes four sets of two LED strips **54"** positioned in end-to-end relationship. If desired, the pair of LED strips **54"** comprising each set can be coupled to an AC-to-DC power supply **84** adjacent the ends of said LED strips **54"** that are positioned adjacent to each other. Also or alternatively, the ends of each set of LED strips **54"** that are adjacent to each other can have one or more electrical jumpers **95** running therebetween whereupon electrical power from AC-to-DC power supply **84** can be provided to the pair of LED strips **54"** from the end of the pair of LED strips **54"** adjacent end **8-2** or end **8-1'**.

While the use of lamps in the form of LED strips **54"** has been described with reference to an embodiment of a light fixture **2'** that includes two lamp carriage assemblies **28"**, it is to be appreciated that each lamp **54**, its corresponding mounting hardware **36** and **38**, and ballast **56** in the embodiment of FIG. **3** can be replaced with one or more lamps **54"** in the form of LED strips coupled directly or indirectly to one or more heat sinks **82** and one or more AC-to-DC power supplies **84**. Hence, the disclosure herein of any particular type or form of lamp is not to be construed as limiting the invention.

It is envisioned that each lamp **54**, **54'**, or **54"** can be suitably controlled by either ballast **56** (lamp **54**) or AC-to-DC power supply **84** (lamps **54'**, **54"**) in any suitable and/or desirable manner, including, without limitation, either manually or via an integrated control system (described hereinafter). In one non-limiting embodiment, each lamp carriage assembly **28**, **28'**, and **28"** is rotatable from its home position clockwise 50 degrees and counterclockwise 50 degrees in one-degree increments. However, this is not to be construed as limiting the invention.

With reference to FIG. **20**, it is envisioned that each lamp carriage assembly **28**, **28'**, and/or **28"** of a number of different lighting fixtures **2**/**2'** can be independently controlled by a control system **86** via a serial-to-parallel adapter **88** and a communication hub **90**. More specifically, each motor control unit **68** can be assigned a unique network address whereupon control system **86** can control each motor **60** coupled to said motor control unit **68** to rotate each lamp carriage assembly **28**, **28'**, and/or **28"** coupled to said motor **60** clockwise, counterclockwise, or both clockwise and counterclockwise independently of each other motor **60** rotating its corresponding lamp carriage assembly or assemblies **28**, **28'**, and/or **28"**. In the embodiment illustrated in FIG. **20**, lighting fixtures **2**/**2'** are connected in series with communication hub **90**. However, this is not to be construed as limiting the invention since it is envisioned that lighting fixtures **2**/**2'** can be connected in parallel or in any combination of serial and parallel deemed suitable and/or desirable by one of ordinary skill in the art.

In the embodiment shown in FIG. **20**, when it is desired to pivot or rotate a lamp carriage assembly **28**, **28'**, and/or **28"** clockwise or counterclockwise, control system **86** outputs a suitable serial data stream that includes the data address of the motor control unit **68** that powers the motor **60** coupled to said lamp carriage assembly **28**, **28'**, and/or **28"**. Serial-to-parallel adapter **88** converts the serial data output by control system **86** into parallel data. Communication hub **90** then translates said parallel data into a control data that is dispatched to the motor control unit **68** of the motor **60** coupled to said lamp carriage assembly **28**, **28'**, and/or **28"** to be rotated or pivoted. In this manner, control system **86** can control the pivoting or rotation of each lamp carriage assembly **28**, **28'**, and/or **28"** independently of each other.

Also or alternatively, control system **86**, serial-to-parallel adapter **88**, and communication hub **90** can be configured to pivot or rotate two or more or all of the lamp carriage assemblies **28**, **28'**, and/or **28"** of the lighting fixtures **2**/**2'** in FIG. **18** in the same or different directions (clockwise or counterclockwise), either independently or substantially simultaneously.

It is also envisioned that control system **86**, serial-to-parallel adapter **88**, and communication hub **90** can also or alternatively be operatively coupled to one or more ballasts **56**, as provided, and/or to one or more AC-to-DC power supplies **84**, as provided, to control the fully on, or fully off, or percent-on operation of the respective lamp(s) **54**, **54'**, and/or **54"** coupled to said one or more ballasts **56** and/or said one or more AC-to-DC power supplies **84**. To this end, it is envisioned that one or more ballasts **56** and/or one or more AC-to-DC power supplies **84** can be independently controlled by control system **86** via serial-to-parallel adapter **88** and communication hub **90**. More specifically, each ballast **56** and/or

each AC-to-DC power supply **84** can be assigned a unique network address whereupon control system **86** can control the state of lamp(s) **54**, **54'**, and/or **54"** coupled to said ballast **56** and/or AC-to-DC power supply **84** to be fully on, or fully off, or partially on.

The capability of a ballast **56** and/or an AC-to-DC power supply **84** to have a network address can be provided via network circuitry provided as part of the ballast **56** and/or the AC-to-DC power supply **84**. Also or alternatively, the network address capability of one or more ballasts **56** and/or one or more AC-to-DC power supplies **84** can be provided by one or more external network circuits (or cards) **93**, with each external network circuit **93** coupled to one or more ballasts **56** and/or one or more AC-to-DC power supplies **84**. Each network circuit **92**, albeit an external network circuit or a network circuit that is part of a ballast **56** and/or an AC-to-DC power supply **84**, can be assigned a unique network address that can be addressed by control system **86** via serial-to-parallel adapter **88** and communication hub **90**, and can include, either alone or in combination with one or more ballasts **56** and/or one or more AC-to-DC power supplies **84** coupled to said network circuit **92**, additional circuitry as required to enable control system **86** to control the fully on, or fully off, or partially on state, e.g., without limitation, 15% on to 90% on, of one or more lamp(s) **54**, **54'**, and/or **54"**.

It is envisioned that under the control of a software program, control system **86** can control the pivoting or rotation of each lamp carriage assembly **28**, **28'**, and/or **28"** and/or the fully on, or fully off, or partially on state of each lamp **54**, **54'**, and/or **54"** coupled to control system **86** via serial-to-parallel adapter **88** and communication hub **90** in any suitable and/or desirable manner. For example, under the control of the software program, control system **86** can cause each of one or a number of lamp carriage assemblies **28**, **28'**, and/or **28"** to rotate or pivot to a desired position. Simultaneously or independently, control system **86**, operating under the control of the software program, can cause each of one or a number of lamps **54**, **54'**, and/or **54"** to assume a fully on state, or a fully off state, or a partially on state.

In one example, under the control of a first thread of execution of the software program, and starting from a state where each lamp carriage assembly **28**, **28'**, and/or **28"** is in its home position with all of the lamps **54**, **54'**, and/or **54"** in their fully on states, control system **86** can be activated to control the pivoting of one or more of said lamp carriage assemblies **28**, **28'**, and/or **28"** and the light output (fully on, or fully off, or partially on) of each of one or more lamps **54**, **54'**, and/or **54"** of said one or more lamp carriage assemblies **28**, **28'**, and/or **28"** for, e.g., a video conference application—where, for example, light is directed in a direction other than the direction the light is directed when each lamp carriage assembly **28**, **28'**, and/or **28"** is in its home position, and the output of a subset of the lamps **54**, **54'**, and/or **54"** is controlled to be fully off, fully on, or partially on.

Upon completion of the video conference, each lamp carriage assembly **28**, **28'**, and/or **28"** can be rotated or pivoted back to its home position and the output of each of lamp **54**, **54'**, and/or **54"** can be returned to its fully on state by control system **86** which can be activated under the control of a second thread of execution of the software program. Each such thread of execution of the software program can be programmed into control system **86** and independently selectable via a human machine interface of control system **86** (described hereinafter). In this way, the pivoting or rotation of a plurality of lamp carriage assembly **28**, **28'**, and/or **28"** and the output (fully on, fully off, or partially on) of each lamp **54**, **54'**, and/or **54"** of said plurality of lamp carriage assembly **28**, **28'**, and/or **28"** can be automatically controlled by control system **86** in concert in any suitable and/or desirable manner that facilitates the realization of a number of different scene lighting arrangements by the lamps **54**, **54'**, and/or **54"** of said lamp carriage assemblies **28**, **28'**, and/or **28"**.

With reference to FIG. **21** and with continuing reference to FIG. **20**, control system **86** can include an integral display (not shown) or can be coupled to a remote display **96** via a wired or wireless connection **98**. Under the control of the software program, control system **86** can display on display **96** a virtual representation **100** of one or more lighting fixtures **2/2'** under the control of control system **86**. Desirably, each lighting fixture **2/2'** is depicted by an icon **102** on virtual representation **100**. Each icon **102** represents a single lighting fixture **2/2'** of the type discussed above that can be controlled by control system **86**. Where virtual representation **100** includes a plurality of icons **102** representing a plurality of lighting fixture **2/2'**, e.g., icons **102-1**-**102-11** representing eleven different lighting fixtures **2/2'**, the relative arrangement and orientation of the plurality of icons **102** on virtual representation **100** desirably corresponds to the arrangement and orientation of the physical lighting fixtures **2/2'** represented by said icons **102** to facilitate the intuitive individual control of each lighting fixture **2/2'** represented by its corresponding icon **102** in the manner to be described hereinafter. However, this is not to be construed as limiting the invention.

It is envisioned that virtual representation **100** can also include one or more additional icons that represent physical objects in proximity to the physical lighting fixtures **2/2'** represented by icons **102**. These additional icons can represent a table, chairs, doors, windows, and the like. However, the inclusion of these additional icons on virtual representation **100** is optional and is not to be construed as limiting the invention.

Optionally, each icon **102-1**-**102-11** can include a status block **104-1**-**104-11** for displaying the status of the lighting fixture **2/2'** associated with said icon **102**. Under the control of the software program, control system **86** can have each status block **104** display operating parameters of the lighting fixture **2/2'** represented by the corresponding icon **102**. For example, without limitation, status block **104-1** can display the percent on status of one or more lamps of the lighting fixture **2/2'** associated with icon **102-1** between 0% and 100%, and/or can display the rotational state of one or more lamp carriage assemblies **28**, **28'**, and/or **28"**, e.g., ±50°, of the lighting fixture **2/2'** associated with icon **102-1**.

Desirably, the software program controlling control system **86** is responsive to the activation of each icon **102** in any suitable and/or desirable manner, such as a finger touch, a stylist touch, or the selection of a computer generated pointer icon, to display a virtual control panel **106** on display **96**. For example, in response to the selection of icon **102-1** in any suitable and/or desirable manner, the software program controlling control system **86** causes a virtual control panel **106-1** to be displayed on display **96**. In one non-limiting embodiment, virtual control panel **106-1** can include a first virtual slide **108** for controlling the on-off or percent on state of one or more lamps of one or more lamp carriage assemblies **28**, **28'**, and/or **28"** of the lighting fixture **2/2'** associated with icon **102-1**, and a second virtual slide **110** for controlling the positive and negative rotation (from the home position) of one or more lamp carriage assemblies **28**, **28'**, and/or **28"** of the lighting fixture **2/2'** associated with icon **102-1**. In the case where icon **102-1** represents a lighting fixture **2** having a single lamp carriage assembly **28**, **28'**, or **28"**, virtual control panel **106-1** can be limited to displaying first virtual slide **108** and second virtual slide **110** as shown in FIG. **21**. However,

where icon **102-1** represents a lighting fixture **2'** having two or more lamp carriage assemblies **28**, **28'**, and/or **28"**, virtual control panel **106-1** can display for each said lamp carriage assembly **28**, **28'**, and/or **28"** first and second virtual slides **108**, **110**. For example, if a lighting fixture **2'** associated with icon **102-1** includes two lamp carriage assemblies **28**, **28'**, and/or **28"**, virtual control panel can include for one of said lamp carriage assemblies a first pair of virtual slides **108**, **110** and can include for the other of said lamp carriage assemblies a second set of virtual slides **108**, **110**. However, this is not to be construed as limiting the invention since it is envisioned that a single set of virtual slides **108** and **110** can be utilized for simultaneously controlling the on-off or percent on state of each lamp and the rotation of each lamp carriage assembly of the lighting fixture **2'** associated with icon **102-1**.

Once the on-off or percent on state of each lamp and the rotation of each lamp carriage assembly of the lighting fixture **2/2'** associated with icon **102-1** have been set as desired, virtual control panel **106-1** can be removed from virtual representation **100** in any suitable or desirable manner, such as, without limitation, by selecting icon **102-1** a second time. Hence, the first selection of icon **102-1** will cause virtual control panel **106-1** to be displayed in virtual representation **100** while the second selection of icon **102-1** will remove virtual control panel **106-1** from virtual representation **100**. In a similar manner, each other icon **102-2-102-11** can be individually selected to display a corresponding virtual control panel **106** that can be utilized for controlling the on-off or percent on state of one or more lamps and/or the rotation of one or more lamp carriage assemblies of the lighting fixture **2/2'** associated with said icon **102**.

Optionally, under the control of the software program, control system **86** can also display on display **96** one or more scene icons **112** and a store icon **114** that can be utilized for programming the on-off percentage of one or more lamps and/or the rotation of one or more lamp carriage assemblies of the lighting fixtures **2/2'** represented by icons **102-1-102-11**. For example, following the adjustment of the on-off percentage of each lamp and/or the rotation of each lamp carriage assembly of each lighting fixture **2/2'** represented by an icon **102** of virtual representation **100** to a desired state in the manner described above, store icon **114** can be selected in any suitable or desirable manner followed by the selection of, for example, scene **1** icon **112-1**, whereupon the on-off or percent on state of each lamp and the rotation state of each lamp carriage assembly is stored in a memory of control system **86** in connection with the scene one icon **112-1** for subsequent retrieval. Thereafter, when it is desired to have the on-off or percent on state of all of the lamps and the rotational states of all of the lamp carriage assemblies of the lighting fixtures **2/2'** represented by icons **102-1-102-11** set to the scene **1** programmed state, scene **1** icon **112-1** is selected in any suitable or desirable manner. In response to selecting scene **1** icon **112-1**, control system **86** recalls from its memory the on-off or percent on state of each lamp and recalls from its memory the rotational state of each lamp carriage assembly of each lighting fixture **2/2'** represented by icons **102-1-102-11** and causes said lamps and lamp carriage assemblies to assume said recalled states.

Hence, as can be seen, the on-off or percent on state of each lamp and the rotational state of each lamp carriage assembly of each lighting fixture **2/2'** represented by an icon **102** of virtual representation **100** can be programmed into control system **86** for subsequent retrieval. Desirably, a number of different on-off or percent on states of the lamps and the rotational states of the lamp carriage assemblies of the lighting fixtures **2/2'** associated with icons **102-1-102-11** can be programmed into control system **86** via individually selectable scene icons **112** by first selecting store icon **114** and then selecting the corresponding scene icon **112** for subsequent retrieval and setting in response to activating the corresponding scene button by itself. In this manner, a number of different lighting scenes can be stored in control system **86** for quick retrieval and setting of the on-off or percent on state of each lamp and the rotational state of each lamp carriage assembly of the lighting fixture **2/2'** associated with icons **102-1-102-11**. For example, control system **86** can be programmed such that in response to selecting scene **1** icon **112-1**, all of the lamps of the lighting fixtures **2/2'** associated with icons **102-1-102-11** assume their fully-on states and the lamp carriage assemblies associated with said lighting fixtures **2/2'** assume their home positions (directing light directly downward). In contrast, the scene **2** icon **112-2** can be programmed whereupon in response to selecting the scene **2** icon **112-2**, the on-off or percent on state of one or more lamps and/or the rotational state of one or more lamp carriage assemblies of the lighting fixtures **2/2'** associated with icons **102-1-102-11** assume different state(s) than the state(s) associated with scene one icon **112-1**. Hence, different combinations of on-off or percent on state of the lamps and/or the rotational states of the lamp carriage assemblies of the lighting fixtures **2/2'** associated with icons **102-1-102-11** can be programmed into control system **86** for quick retrieval in response to selecting one of the scene icons **112**.

The present invention has been described with reference to the preferred embodiments. Obvious modifications and alterations will occur to others upon reading and understanding the preceding detailed description. It is intended that the invention be construed as including all such modifications and alterations insofar as they come within the scope of the appended claims or the equivalents thereof.

The invention claimed is:

1. A lighting fixture comprising:

a housing;

at least one lamp carriage assembly disposed inside the housing and supporting one or more light emitting diodes coupled to a heat sink; and

at least one motor coupled between the housing and the lamp carriage assembly, said motor operative for pivoting the lamp carriage assembly relative to the housing about a pivot axis of the lamp carriage assembly, wherein the heat sink and an open side of the housing are positioned on opposite sides of the pivot axis of the lamp carriage assembly.

2. The lighting fixture of claim **1**, wherein the motor is operative for pivoting the lamp carriage assembly under the control of a controller which controls the motor via wired, or wireless, or both wired and wireless communication.

3. The lighting fixture of claim **1**, wherein the motor is operative for pivoting the lamp carriage assembly about its pivot axis in a first direction, a second direction, or both the first and second directions.

4. The lighting fixture of claim **1**, wherein two lamp carriage assemblies are disposed side-by-side in the housing.

5. The lighting fixture of claim **4**, wherein each lamp carriage assembly is pivotable about its pivot axis in a first direction, a second direction, or both the first and second directions independently of each other lamp carriage assembly.

6. The lighting fixture of claim **5**, wherein two motors are coupled between the two lamp carriage assemblies and the housing, with each motor coupled between one of the lamp carriage assemblies and the housing.

7. The lighting fixture of claim 1, further including:

a reflector disposed in the lamp carriage assembly such that light output by at least one of the one or more light emitting diodes is directed by the reflector toward the open side of the housing.

8. The lighting fixture of claim 1, wherein:

the housing is a rectangular box-like structure having the open side; and

the lamp carriage assembly supports the one or more light emitting diodes to output light via the open side of the housing.

9. A lighting fixture comprising:

a housing defining an axis;

a first lamp carriage assembly supported inside the housing for pivoting about a pivot axis of the first lamp carriage assembly that is parallel with the axis of the housing;

one or more light emitting diodes carried by the first lamp carriage assembly, wherein the one or more light emitting diodes carried by the first lamp carriage assembly are coupled to a first heat sink; and

a first motor coupled between the housing and the first lamp carriage assembly and operative for pivoting the first lamp carriage assembly relative to the housing about the pivot axis of the first lamp carriage assembly, wherein the first heat sink and an open side of the housing are positioned on opposite sides of the pivot axis of the first lamp carriage assembly.

10. The lighting fixture of claim 9, further comprising:

a second lamp carriage assembly supported inside the housing for pivoting about a pivot axis of the second lamp carriage assembly that is parallel with the axis of the housing;

one or more light emitting diodes carried by the second lamp carriage assembly, wherein the one or more light emitting diodes carried by the second lamp carriage assembly are coupled to a second heat sink; and

a second motor coupled between the housing and the second lamp carriage assembly and operative for pivoting the second lamp carriage assembly relative to the housing about the pivot axis of the second lamp carriage assembly, wherein the second heat sink and the open side of the housing are positioned on opposite sides of the pivot axis of the second lamp carriage assembly.

11. The lighting fixture of claim 10, wherein each lamp carriage assembly is pivotable about its pivot axis in a first direction, a second direction, or both the first and second directions independently of the other lamp carriage assembly.

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