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Osur et al.

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(54) **LIGHT FIXTURE FOR CONTOURED CONTEXT INSTALLATION**

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(51) **Int. Cl.**

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F21S 8/04	(2006.01)
F21V 5/00	(2018.01)
F21V 17/10	(2006.01)

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

CPC . ***F21S 4/22*** (2016.01); ***F21S 8/04*** (2013.01); ***F21V 5/00*** (2013.01); ***F21V 17/10*** (2013.01)

(58) **Field of Classification Search**

CPC F21S 8/026; F21S 8/04; F21S 4/22; F21S 4/24; F21S 4/28; F21V 33/006; F21V 21/049; E04F 2290/026

See application file for complete search history.

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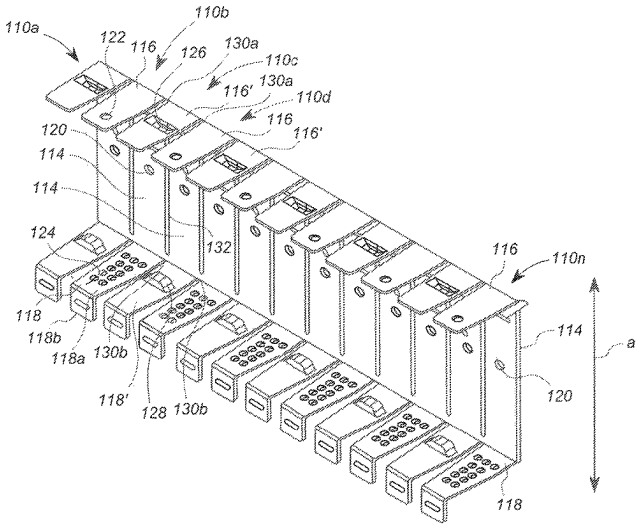
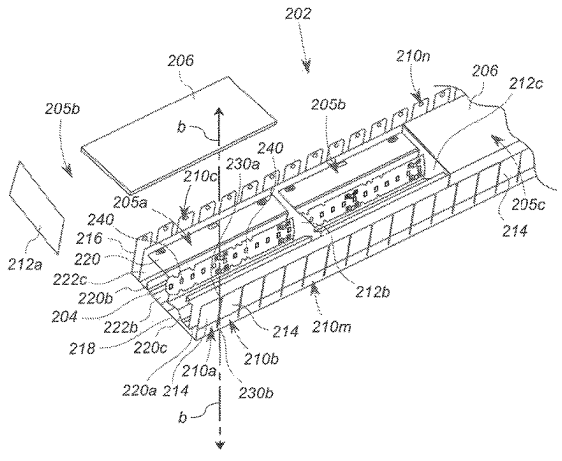
(57) **ABSTRACT**

A light fixture assembly includes a bracket, a flexible substrate, and a flexible lens. The bracket has a plurality of connected segments. Each segment has a back wall operably connected to a back wall of an adjacent segment such as to allow relative rotatable movement therebetween. Each segment has a top wall fixedly attached to the back wall, and a bottom wall fixedly attached to the back wall. The flexible substrate has a plurality of lamps affixed thereto. The flexible substrate is attached to the back walls of at least some of the connected segments. The flexible lens is configured to be mounted to the top walls and the bottom walls of at least some of the segments, such that light from the plurality of lamps radiates through the lens.

17 Claims, 6 Drawing Sheets





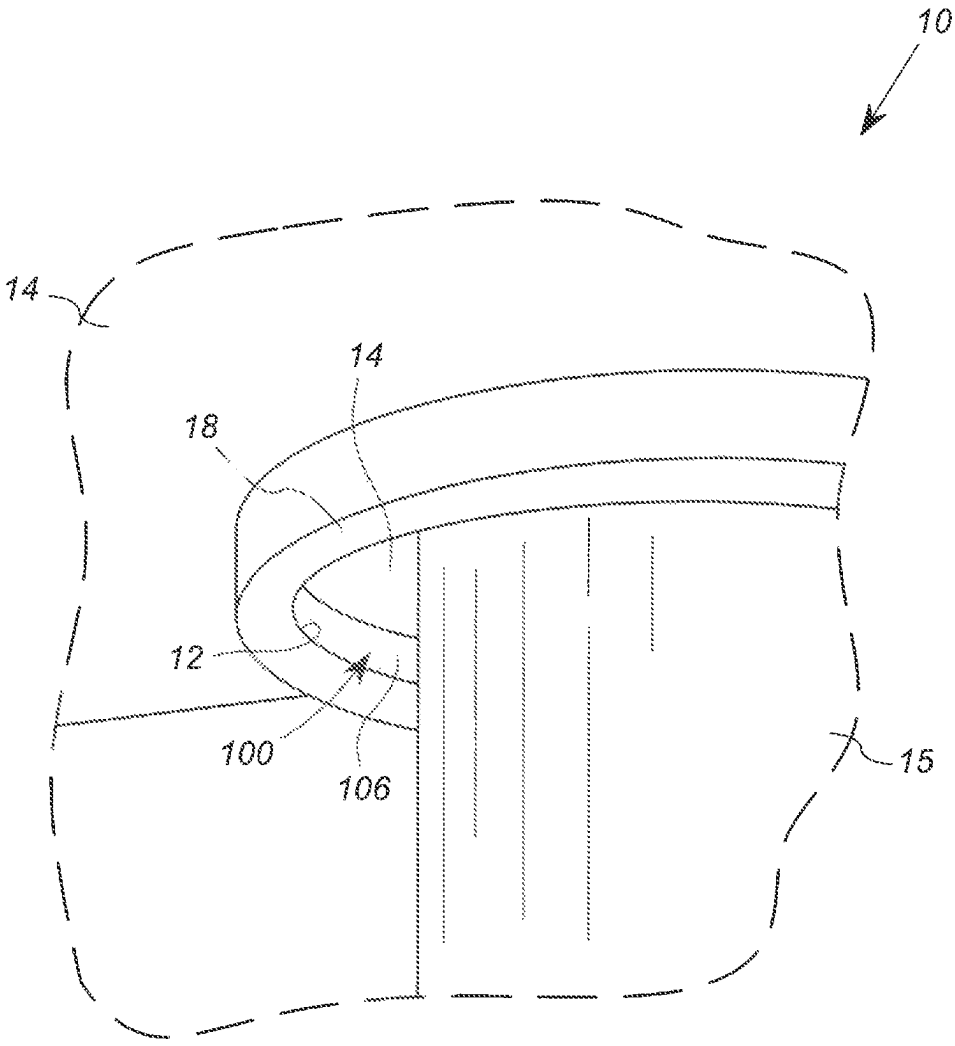


FIG. 1

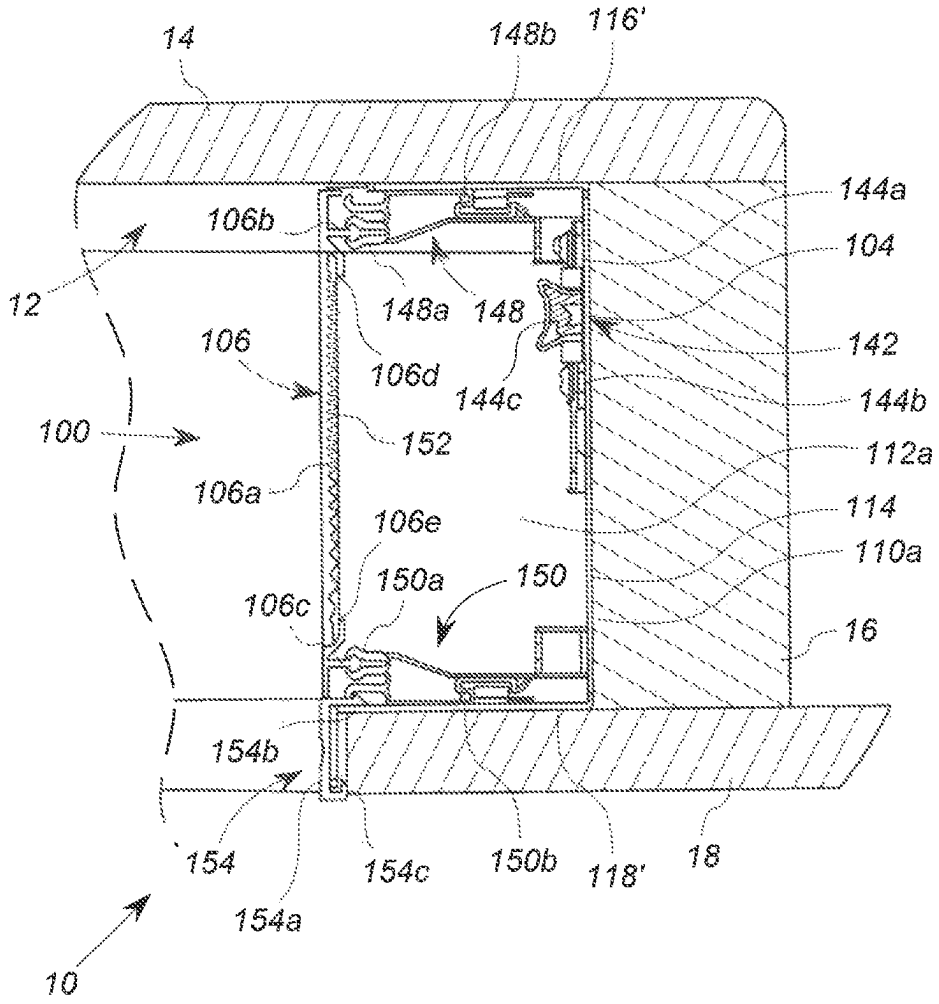

14
148b
116'
144a
106b
104
12
148a
148
142
106
106d
144c
144b
100
152
112a
106a
114
106e
110a
150a
150
106c
16
154b
154
154c
150b
118'
18
154a
10

FIG. 2

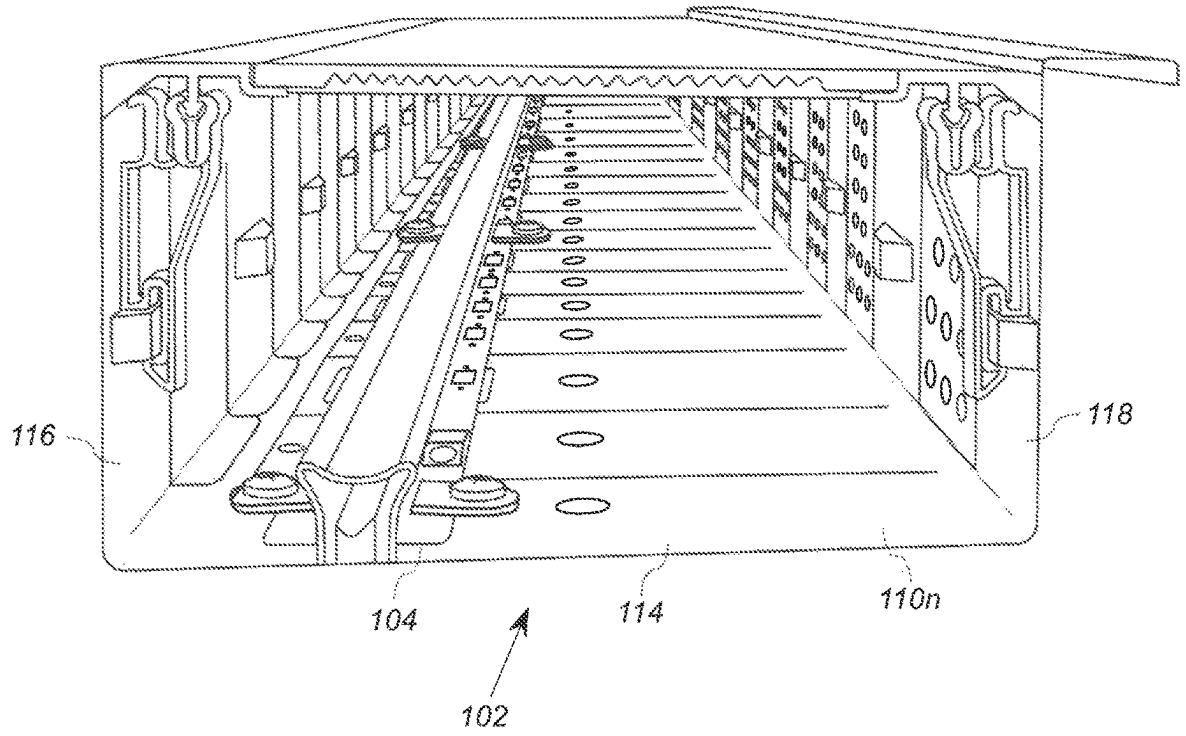


FIG. 3

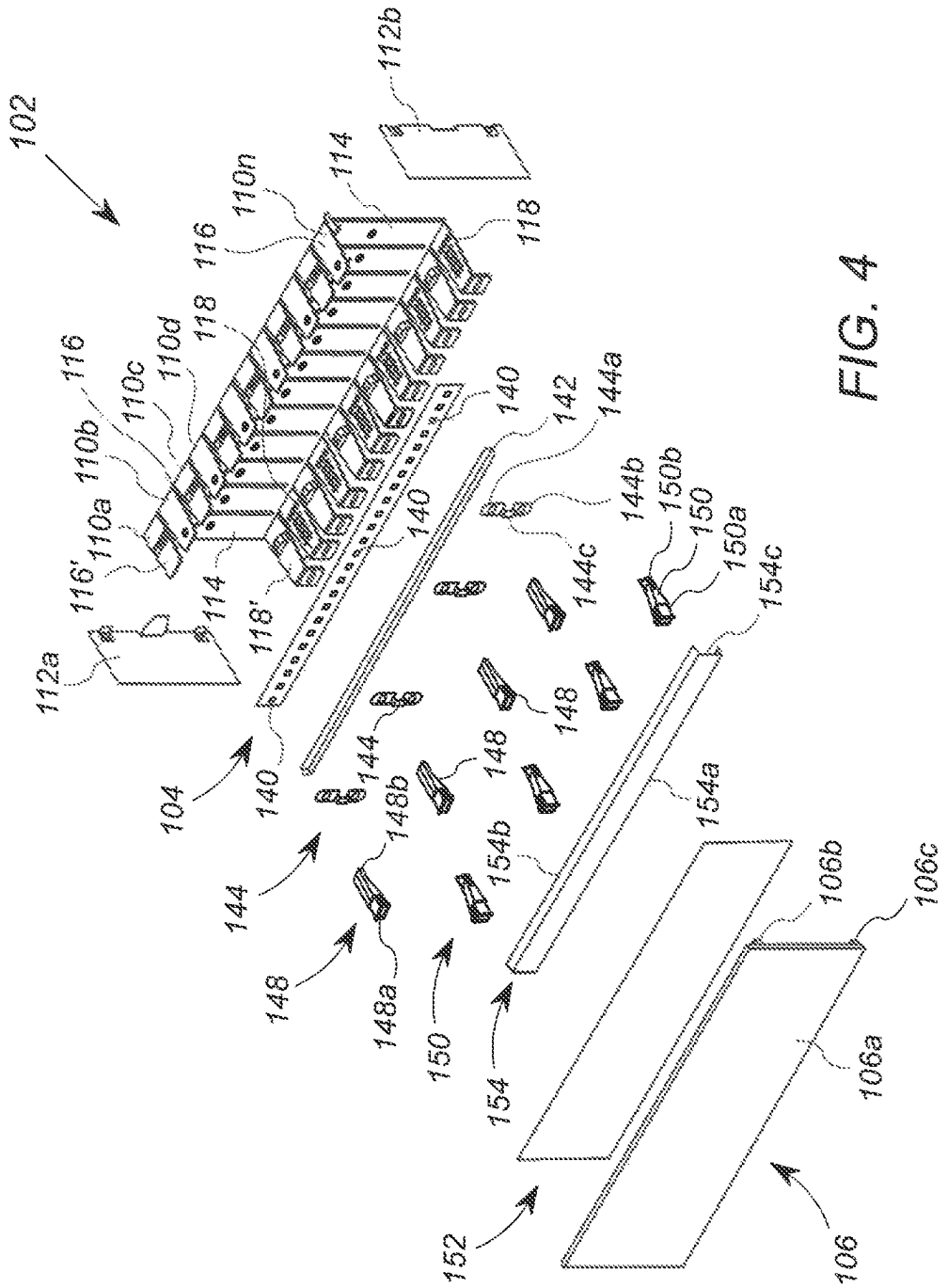

102
112b
114
110n
116
118
110d
110c
110b
110a
116'
114
118'
112a
140
142
144a
144b
150b
150
150a
144c
154c
104
144
148
148b
154b
154a
148a
150
154
152
106b
106c
106a
106

FIG. 4

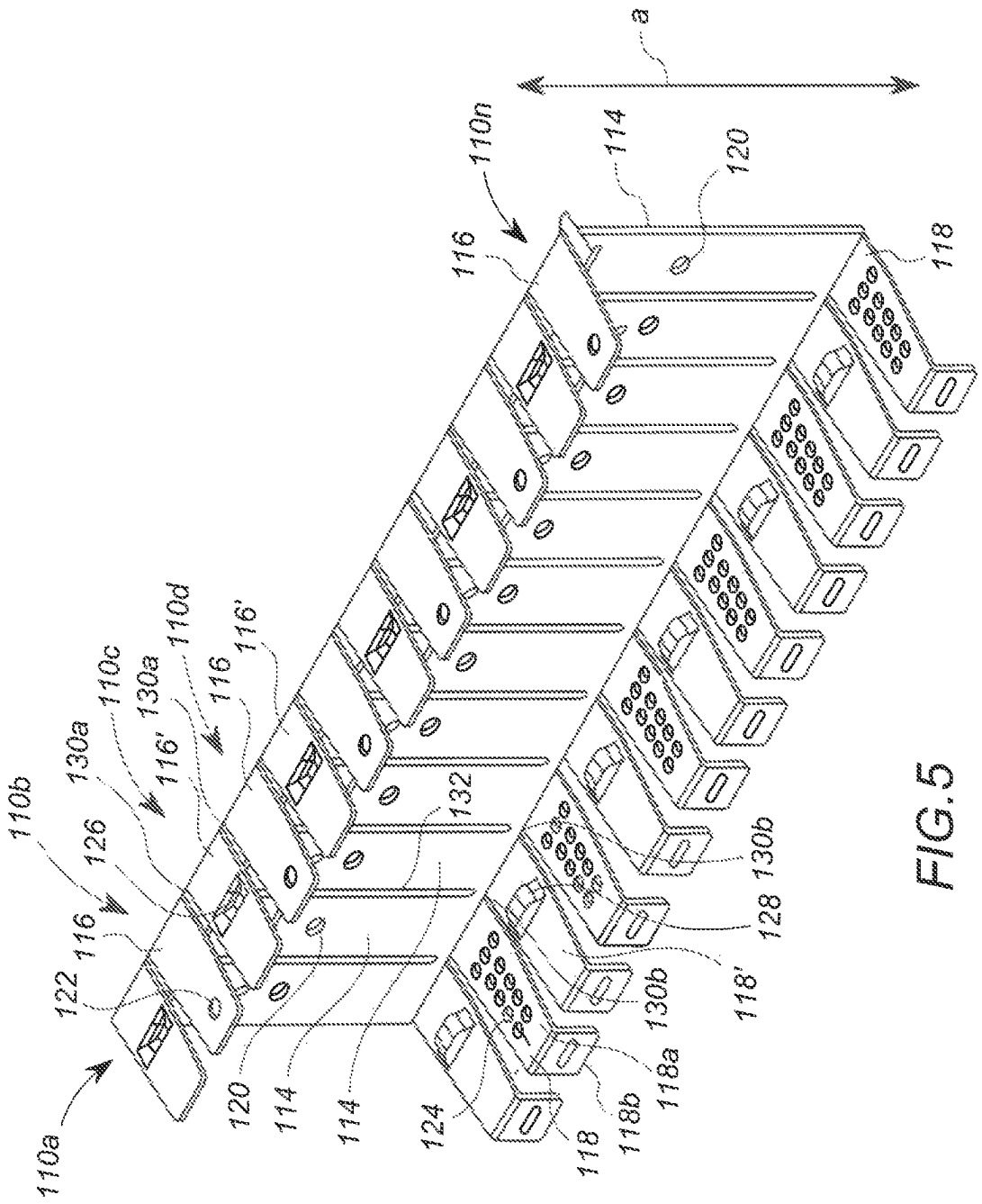

a
110n
114
120
116
118
110d
116'
110c
130a
116
130a
116'
110b
126
132
116
122
130b
128
118'
130b
118a
118b
118
124
114
114
120
110a

FIG.5

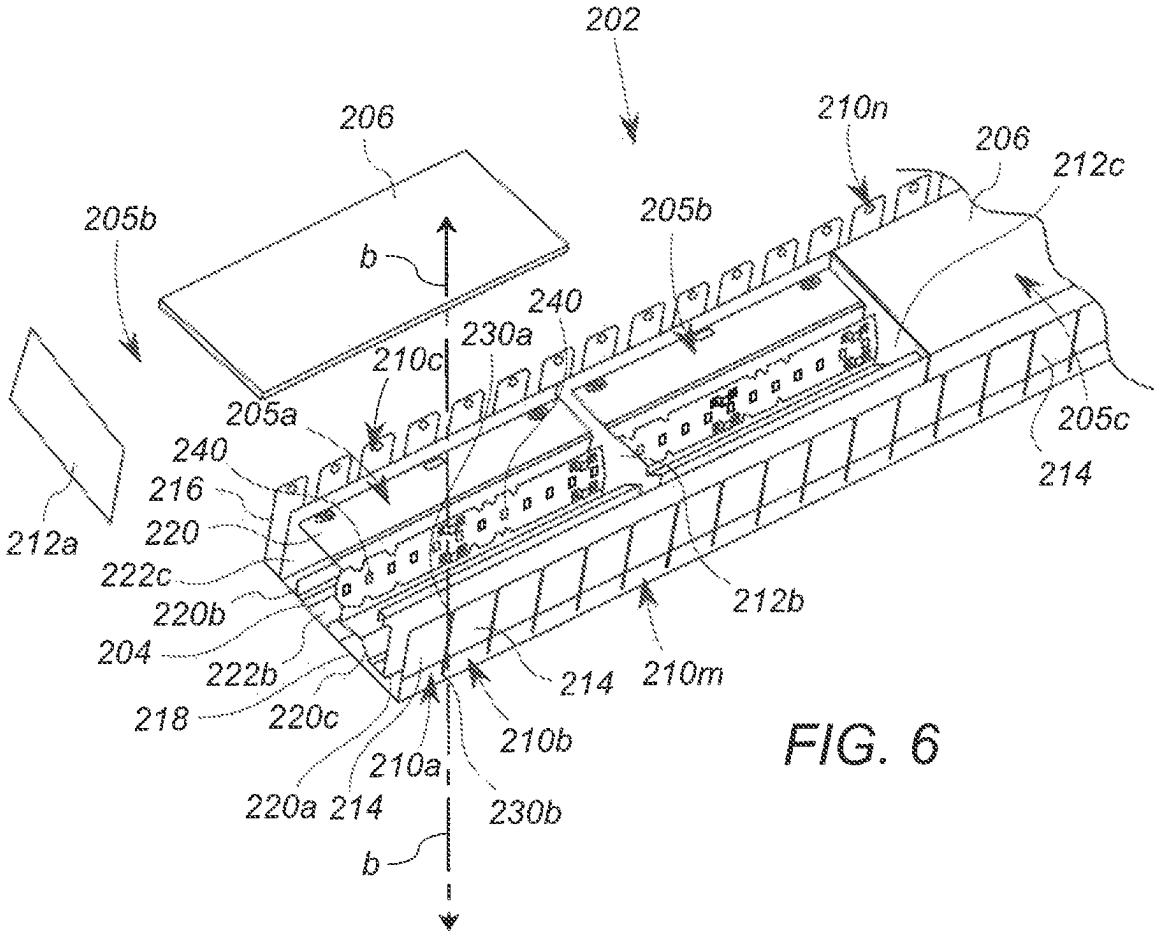

202
206
210n
206
212c
205b
205b
b
240
230a
210c
205a
240
216
220
222c
220b
204
222b
218
220c
220a
214
210a
210b
230b
214
210m
212b
205c
214
212a
b

FIG. 6

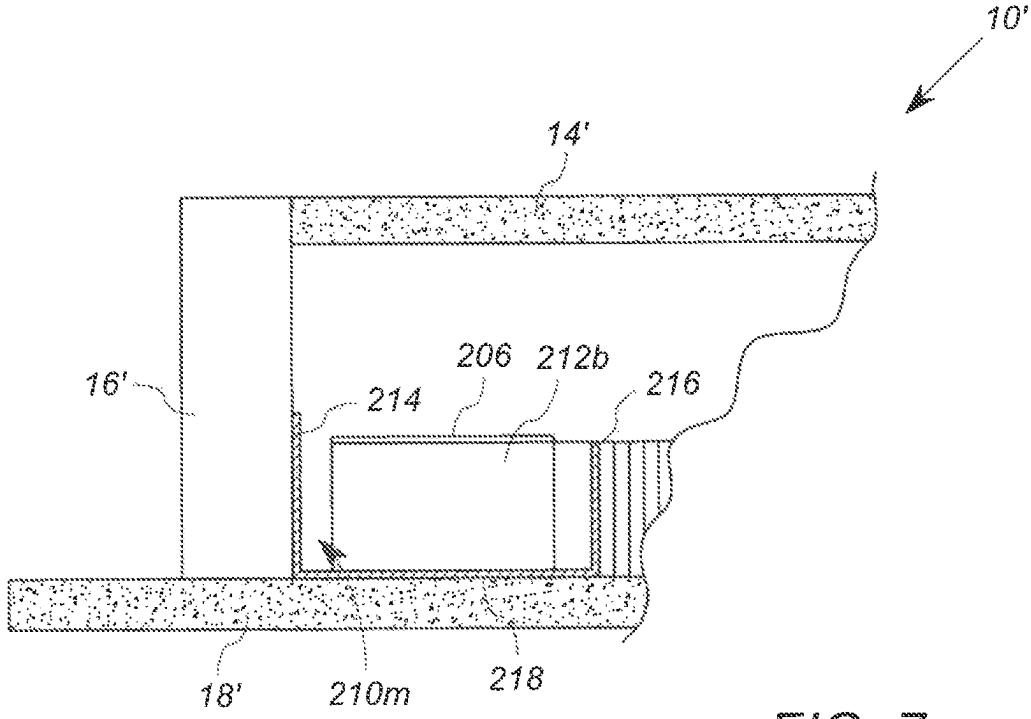

10'
14'
16'
206
212b
214
216
18'
210m
218

FIG. 7

LIGHT FIXTURE FOR CONTOURED CONTEXT INSTALLATION

FIELD OF THE INVENTION

The present invention relates generally to lighting fixtures.

BACKGROUND

Lighting fixtures for commercial, industrial, accent and home use often install directly in the ceiling or wall of a room or space of a building. LED lighting fixtures have gained popularity in many applications due to the efficiency of LED lighting, and the flexibility in lighting fixture design. An LED lighting fixture typically include a fixture frame that supports LED lights, electrical circuits that provide power to the LED lights, and a lens through which light from the fixture can illuminate a space.

It is desirable in some cases to provide lighting fixtures that conform to the shape of the wall and/or ceiling to which they are attached. Lighting fixtures arranged for curved walls are particularly challenging because the radius of curvature of the wall can vary significantly, as opposed to straight walls and/or wall corners.

Accordingly, there is a need for a lighting fixture that can readily be adapted for use in curved walls of varying radii.

SUMMARY

The embodiments disclosed herein address the above-referenced need, as well as others, by flexible lighting fixture having a segmented mounting bracket. The flexible bracket and other features allow the fixture to be readily be curved (e.g. bent) in any number of curved shapes.

A first embodiment is light fixture assembly that includes a bracket, a flexible substrate, and a flexible lens. The bracket has a plurality of connected segments. Each segment has a back wall operably connected to a back wall of an adjacent segment such as to allow relative rotatable movement therebetween. Each segment has a top wall fixedly attached to the back wall, and a bottom wall fixedly attached to the back wall. The flexible substrate has a plurality of lamps affixed thereto. The flexible substrate is attached to the back walls of the plurality of connected segments. The flexible lens is configured to be mounted to the top walls and the bottom walls of at least some of the segments, such that light from the plurality of lamps radiates through the lens.

The above-described features and advantages, as well as others, will become more readily apparent to those of ordinary skill in the art by reference to the following detailed description and accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** shows a bottom fragmentary perspective view of a cove having a light fixture according to a first embodiment;

FIG. **2** shows a cutaway view of the light fixture of FIG. **1** in a fragmentary portion of the cove of FIG. **1**;

FIG. **3** shows an elevated perspective end view of the light fixture assembly of FIG. **1** in a non-contoured state without end plates;

FIG. **4** shows an exploded perspective view of the light fixture of FIG. **1**;

FIG. **5** shows a perspective view of a bracket of the light fixture of FIG. **1**;

FIG. **6** shows a partially exploded, perspective view of a light fixture according to a second embodiment; and

FIG. **7** shows a cutaway view of the light fixture of FIG. **6** in a fragmentary portion of a cove of a building or facility.

DETAILED DESCRIPTION

FIG. **1** shows perspective view of an illuminated contoured cove **10** that includes a light fixture assembly **100** according to a first embodiment. FIG. **2** shows a cutaway view of the illuminated cove of FIG. **1** taken from near an end of the fixture assembly **100**. The illuminated contour cover **10** can suitably be located within a building or other architectural structure, not shown.

The illuminated contoured cove **10** in this embodiment includes a cove **12** and the fixture assembly **100**. The cove **12** is a concave space formed by a portion of an upper wall **14**, a backing wall **16**, and a cove base **18**. As shown in FIG. **2**, the backing wall **16** extends from the upper wall **14** to the cove base **18** to form the concave space. As shown in FIG. **1**, the cove **12** in this embodiment extends in a contoured manner, as a result of the cove base **18** and backing wall **16** (not visible in FIG. **2**) similarly extending a contoured manner. In many cases, the cove base **18** and backing wall **16** extend in a manner that defines a contoured cove **12** having a uniform cross-section that takes the form shown in FIG. **2**.

In this example, the cove **12** is part of an architectural feature that includes a pillar **15** around which the cove **12** extends. However, it will be appreciated that coves may be used in a variety of settings, and that cove **12** is given only by way of example. For example, the upper wall **14** and/or the cove base **18** may form all or part of the ceiling of a room or other interior or exterior space. In other embodiments, the cove **12** may constitute an inset from a wall, not shown, or other architectural structure that is below and/or near the ceiling. The fixture assembly **100** is compatible with coves **12** disposed in any commercially known cove structure having an upper wall, base and backing wall.

In general, the fixture assembly **100** includes a configurable bracket **102**, a flexible substrate **104** having a plurality of lamps affixed thereto, and a flexible lens **106**. Further detail regarding the structure of the fixture assembly **100** is provided below with additional reference to FIGS. **3** and **4**. FIG. **3** shows a slightly elevated end view of the fixture assembly **100** apart from the cove **12**, and in a non-contoured state. FIG. **4**. shows an exploded perspective view of the fixture assembly **100**, also in a non-contoured state. As will be discussed below, the fixture assembly **100** is configured to flex along its length to fit contoured coves such as the cove **12** of FIG. **1**, or other contoured surfaces.

With reference to FIGS. **2**, **3** and **4**, the bracket **102** of the fixture assembly **100** has a plurality of connected segments **110***a*, **110***b*, **110***c* and so forth, and two end plates **112***a*, **112***b*. Each segment **110***a*, **110***b*, **110***c*, . . . **110***n* and so forth has a back wall **114**, a top wall **116** or **116'**, and a bottom wall **118** or **118'**. The back wall **114** of each segment **110***a*, **110***b*, **110***c*, . . . **110***n* is operably connected to a back wall **114** of an adjacent segment **110***a*, **110***b*, **110***c*, . . . **110***n* to allow relative rotatable movement therebetween. Accordingly, it will be appreciated that most segments **110***b*, **110***c*, etc. have back walls **114** that are coupled on either side to back walls **114** of other segments. For example, the segment **110***b* has a back wall **114** that is coupled on either side to the back walls **114** of adjacent segments **110***a* and **110***c*. By contrast, the first segment **110***a* is coupled only on one side to the segment **110***b*, and on the other side to the end plate **112***a*.

Similarly, the last segment **110***n* is coupled only on one side to a segment, and on the other side to the end plate **112***b*.

Further detail regarding the bracket **102** is provided in connection with FIG. **5**. FIG. **5** shows an enlarged perspective view of the plurality of segments **110***a*, **110***b*, **110***c*, . . . **110***n* of the bracket **102** without the end plates **112***a*, **112***b*. Referring to the segment **110***b*, the back wall **114** may be in the form of an elongate malleable plate, such as an aluminum plate, that extends vertically lengthwise from the top wall **116** to the bottom wall **118**. It will be appreciated that the use of the directional terms "vertical", "top", "bottom", etc. refers to directions with respect to the mounting of lighting assembly **100** as shown in FIG. **2**, wherein the back wall **114** extends vertically on a vertical wall. Embodiments of the lighting assembly may also be mounted in such that the back wall **114** of the segments **110***a*, **110***b*, **110***c*, . . . **110***n* extends horizontally, such as against a ceiling. In such embodiments, it will be appreciated that any vertical and horizontal references would be changed accordingly.

Referring again to the present embodiment, as shown in FIG. **5**, the back wall **114** includes through-holes **120** used for mounting the bracket **102** to a wall, for example, the wall **16** of FIG. **2**, using suitable fasteners. The segment **110***b* in this embodiment has a first top wall **116** of two configurations of top walls **116**, **116'** in the bracket **102**, and a first bottom wall **118** of two configurations of bottom walls **118**, **118'** in the bracket **102**.

The back wall **114** of the segment **110***b* is coupled to the back wall of the adjacent segment **110***c* by at least one flexible hinge, and in this case flexible hinges **130***a*, **130***b*. The flexible hinge **130***a* is connected at the tops of the back walls **114** of the segments **110***b*, **110***c*, and the flexible hinge **130***b* is connected at the bottoms of the back walls **114** of the segments **110***b*, **110***c*. The flexible hinges **130***a*, **130***b* define a vertical axis, parallel to the axis a of FIG. **5**, of relative rotation or pivotal movement between the segment **110***b* and the segment **110***c*. The flexible hinges **130***a*, **130***b* are configured to flex and rotate about the vertical axis under external force (other than mere weight of the bracket **102**), such as manual bending force. It will be appreciated that the flexible hinges **130***a*, **130***b* in some embodiments can have less stiffness such that they can bend under their own weight. However, the present embodiment provides the advantage of shape retention after fitting. As a consequence, the flexible hinges **130***a*, **130***b* can be flexed or rotated in to select relative angle, and upon removal of the external force, retain that relative angle absent external force (i.e., does not deform under its own weight).

All of the segments **110***a*, **110***b*, **110***c* . . . **110***n* are connected to each other by similar flexible hinges, such that all are capable of relative pivotal or rotational movement about vertical axes parallel to the vertical axes a shown in FIG. **5**. By contrast, the top walls **116**, **116'** and the bottom walls **118**, **118'** of the segments **110***a*, **110***b*, **110***c* . . . **110***n* are not connected to each other in order to allow them to rotate with respect to each other about the vertical axes. The relative rotational angle between each set of adjacent segments **110***a*, **110***b*, **110***c* . . . **110***n* may be different, or the same. As a result, the bracket **102** may be flexed in many ways, including moderately tight curves, S-curves, etc.

The flexible hinges **130***a*, **130***b* in this embodiment are integral to the back walls **114** of the segments **110***b*, **110***c*. Specifically, as discussed above, the segments **110***a*, **110***b*, **110***c* . . . **110***n* in this embodiment are formed from a single sheet of metal. The segments **110***a*, **110***b*, **110***c* . . . **110***n* are formed by punching out the metal between adjacent segments. To form the flexible hinges **130***a*, **130***b*, a small portion of the metal near the tops of the back walls **114** between adjacent segments **110***b* and **110***c* is not punched, or in other words is left in place. This creates an interior void **132** between the back walls **114** of the segments **110***b*, **110***c*, and between the flexible hinges **130***a*, **130***b*. The flexible hinges **130***a*, **130***b* and void **132** are configured to retain a strong connection between the segments **110***b*, **110***c*, but also create reduced stiffness about the axis a. The reduced stiffness allows at least some relative rotational movement between the segments **110***b*, **110***c* about the axis a when suitable pressure is applied. It will be appreciated that the back wall **114** of the segment **110***b* is preferably coupled to the segment **110***a* in the same manner, thereby providing a similar axis of rotation (parallel to the axis a) between the segments **110***a*, **110***b*.

The top wall **116** extends away from a first end of the back wall **114** in a first direction, which in this embodiment perpendicularly. The top wall **116** is fixedly attached to the back wall **114**. The top wall **116** in this embodiment is also an elongate plate, and may be formed from the same piece of metal as the back wall **114**. The top wall **116** of the segment **110***b* further includes at least one through-hole **122** that may be used for mounting the bracket **102** to a wall, such as the upper wall **14** of the cove **12**, as shown in FIG. **2**.

The bottom wall **118** has a main portion **118***a* that extends away from the second end of the back wall **114** in generally the same first direction. The bottom wall **118** is fixedly attached to the back wall **114**. The bottom wall **118** in this embodiment also includes a bent portion **118***b* that extends from the end of the main portion **118***a* in a second direction generally perpendicular to the first direction. The second direction may extend in the same general direction as the back wall **114**. In general, the main portion **118***a* may suitably be an elongate plate and the bent portion **118***b* may be formed from the same material as the main portion **118***a*, with both portions **118***a*, **118***b* formed from the same piece of metal as the back wall **114**. The main portion **118***a* of the bottom wall **118** of the segment **110***b* further includes at least one through-hole **124** that may be used for mounting the bracket **102** to a wall, such as the lower wall **18** of the cove **12**, as shown in FIG. **2**.

A first subset of the segments **110***a*, **110***b*, **110***c* . . . **110***n* may have the same structure as the segment **102***b*. In this embodiment, another subset of the segments **110***a*, **110***b*, **110***c* . . . **110***n* may have the same general structure, but with different configurations of the top wall **116'** and the bottom wall **118'**. By way of example, each of the segments **110***a*, **110***c* has a back wall **114** identical to that of the segment **102***b*, but has a different top wall **116'** that has a different configuration than the top wall **116**. Likewise, the segment **112***c* may have a different bottom wall **118'** than the bottom wall **118**.

The alternative configuration of the top wall **116'** is identical to the top wall **116** but includes a bridge lance **126** instead of the through-hole **122**. The bridge lance **126** is a downward bridge structure that allows for connection of a clip, a will be discussed further below. Likewise, the alternative configuration of the bottom wall **118'** is identical to the bottom wall **118** but includes another bridge lance **128** instead of the at least one through-hole **124**. The bridge lance **128** is likewise a bridge structure that allows for connection of a clip, a will be discussed further below. The bridge lances **126**, **128** may be formed from partially punched out metal strips that extend vertically from the surfaces of the surfaces of, but remain connected at either end to, the top wall **116'** and the bottom wall **118'**, respectively.

In this embodiment, every other segment **110***b*, **110***d* and so forth has the first configuration of the top wall **116** and bottom wall **118**, and every other segment **110***a*, **110***c* etc. have the second configuration of the top wall **116'** and bottom wall **118'**. However, it will be appreciated that in other embodiments, the configurations need not alternate, or need not even be split into multiple configurations. It will be appreciated that to the extent bridge lances **126**, **128** and through-holes **122**, **124** are used, they may be arranged on the tops and bottom walls of the segments **110***a*, **110***b*, **110***c* and so forth in any configuration, or even on the same segments.

In general, the adjacent segments **110***a*, **110***b*, **110***c* form a flexible C-shaped frame or channel in which lighting elements may be disposed, as will be discussed further below.

Referring again to FIGS. **2**, **3** and **4**, the flexible substrate **104** includes a plurality of LED lamps **140** affixed thereto. The flexible substrate **104** can extend the length of the bracket **102** and is affixed to the back walls **114** of at least some of the segments **110***a*, **110***b*, **110***c* and so forth. The flexible substrate **104** in this embodiment is affixed at least partly via adhesive backing on the flexible substrate **104**. The flexible substrate **104** and lamps **140** may suitably be a flexible LED module available from Luxtech LLC of Philadelphia, Pa.

It will be appreciated that in some embodiments the flexible substrate **104** can be affixed instead to the top walls **116**, **116'** to provide a different angle of light emission.

The fixture **100** further includes a flexible linear optic **142** which is configured to extend over the LED lamps **140** of the flexible substrate **104**, and reflect and/or refract light generated by the LED lamps **140** to concentrate the light in a select direction. Such flexible linear optics may suitably be formed of PMMA, and have a geometry configured to enhance the concentration of the generated light to a desired feature of the cove **12** or other architectural element. In this embodiment, the flexible linear optic **142** is affixed against or adjacent to the LED lamps **140** by a plurality of clips **144**. The clips **144** and the linear optic **142** also support the flexible substrate **104** against the back wall. Each of the plurality of clips **144** has two feet **144***a*, **144***b* that are coupled to the back walls **114** of at least some of the segments **110***a*, **110***b*, **110***c* . . . **110***n*. Each of the plurality of clips **144** has a bridge section **144***c* that extends over the flexible linear optic **142**, lamps **140** and substrate **104** between the feet **144***a* and **144***b*.

The flexible lens **106** in this embodiment may also be a PMMA structure that passes light and covers the interior of the fixture **100**. The flexible lens **106** in this embodiment has a flexible lens plate **106***a* that includes an asymmetric throw ribbing pattern for directing light in a predetermined, select direction. The flexible lens plate **106***a* extends lengthwise approximately the length of the bracket **102**. The flexible lens **106** further includes an upper connection rib **106***b* and a lower connection rib **106***c*, both of which may be integrally formed with the lens plate **106***a*. The upper connection rib **106***b* is disposed on the rear of, and near the top of, the lens plate **106***a*, and extends substantially the entire length of the lens **106**. The lower connection rib **106***c* is disposed on the rear of, and near the bottom of, the lens plate **106***a*, and extends substantially the entire length of the lens **106**.

The upper connection rib **106***b* is configured to be received by a first snap clip **148***a* of each of a plurality of double clips **148**, and the lower connection rib **106***c* is configured to be received by a first snap clap **150***a* of each of another plurality of double clips **150**. The second snap clip **148***b* of each of the double clips **148** is configured to receive and engage a corresponding one of the bridge lances **126** on the bracket **102**, and the second snap clip **150***b* of each of the double clips **150** is configured to receive and engage a corresponding one of the bridge lances **128** of the bracket **102**. As a result, the lens **106** is operably coupled to bracket **102**.

The fixture **100** in this embodiment further includes an additional flexible diffusion lens or film **152**, which may be frosted to soften the light. The flexible diffusion film **152** is operably coupled to or against the lens **106**. To this end, the lens **106** in this embodiment further includes an upper channel **106***d* and a lower channel **106***e*. The upper channel **106***d* has a downward facing opening, and extends below and along the upper connection tab **106***b*. Conversely, the lower channel **106***e* has an upward facing opening, and extends above and along the lower connection tab **106***c*. The upper and lower channels **106***d*, **106***e* are configured to receive the edges of the flexible diffusion film **152** to secure retain the film **152** against the lens **106**.

The fixture **100** in this embodiment further includes a flexible spackle plate **154** that extends the length of the fixture **100**, and has a vertical width to extend over the bent portion **118***b* of the bottom plates **118**, **118'** of the segments **110***a*, **110***b*, **110***c* . . . **110***n* of the bracket **102**. The spackle plate **154** includes a front face plate **154***a*, a top plate **154***b*, and bottom hook **154***c*. The front face plate **154***a* is configured to extend downward on or against an exposed edge of the cove base **18** if necessary, in order to provide a base for spackling to finish the installation. The top plate **154***b* is configured extend part way along the bottom walls **118**, **118'**, and may be secured in position by a feature that interacts with a corresponding mating feature on the clips **150**. The bottom hook **154***c* extends from the bottom face plate **154***a* to receive and engage the bottom edge of the bent portion **118***b* of the bottom walls **118**, **118'**.

In at least one embodiment, the design of the light fixture **100** allows not only for various curved shapes, but also facilitates producing versions of the light fixture **100** at select lengths. In particular, to generate the light fixture **100** at a select length, the user obtains a bracket **102** having a quantity of segments **110***a*, **110***b*, **110***c* . . . **110***n* corresponding to the desired length. To this end, the user can cut or otherwise separate the select number of segments **110***a*, **110***b* etc. from a blank formed of longer set of segments, not shown, but which would constitute a longer version of the segments **110***a*, **110***b*, **110***c* . . . **110***n* shown in FIG. **5**. As discussed above, the flexible substrate **104** and lamps **140** may suitably be a flexible LED module available from Luxtech LLC of Philadelphia, Pa, which are provided on a long, wound roll that allows custom lengths to be cut. Thus, the flexible substrate **104** in this embodiment may be cut to a length corresponding to the desired length. In a similar manner, the lens **106**, the linear optic **142**, the flexible film **152**, and the spackle plate **154** all have generally uniform cross-sections in this embodiment, and thus may be cut to any suitable length.

In operation, the light fixture **100** is initially in a non-contoured state, such as shown in FIGS. **3**, **4** and **5**. The user then configures the light fixture **100** to the desired length for the cove **12** in the manner discussed above. The light fixture **100** can then be manually bent (or with the aid of tools) along the vertical axes between adjacent ones of the segments **110***a*, **110***b*, **110***c*, . . . **110***n* to achieve a contour that matches approximately the backing wall **16** of the cove **12**. The light fixture **100** may then be wired and affixed to the

back wall **16**, the top wall **14** and/or the cove base **18** of the cove **12** in any suitable manner.

Another embodiment of lighting fixture **200** that may also be manually contoured and easily adjusted to multiple lengths is shown in FIGS. **6** and **7**. FIG. **6** shows a partially exploded, fragmentary perspective view of the lighting fixture **200**, and FIG. **7** shows a cutaway view of the lighting fixture **200** of FIG. **6** disposed in cove **12'**.

In general, the fixture assembly **200** includes a bracket **202** and a plurality of lamp modules **205***a*, **205***b*, **205***cc*. Each of the lamp modules **205***a*, **205***b*, **205***c* includes a module frame **222** at least one substrate **204** having a plurality of lamps affixed thereto, and a lens **206**. As will be discussed below, the fixture assembly **200** is configured to flex along its length to fit contoured coves such as the cove **12'** of FIG. **7**, or other contoured surfaces.

With reference to FIGS. **6** and **7**, the bracket **202** of the fixture assembly **100** has a plurality of connected segments **210***a*, **210***b*, **210***c* and so forth. Each segment **210***a*, **210***b*, **210***c*, **210***n* and so forth has a front wall **214**, an end wall **216**, and a bottom wall **218**. The front wall **214** of each segment **210***a*, **210***b*, **210***c*, . . . **210***n* is operably connected to a front wall **214** of an adjacent segment **210***a*, **210***b*, **210***c*, . . . **210***n* to allow relative rotatable movement therebetween. Accordingly, it will be appreciated that most segments **210***b*, **210***c*, etc. have back walls **214** that are coupled on either side to back walls **214** of other segments, similar to the back walls **114** of the segments **110***a*, **110***b*, **110***c* discussed above in connection with FIGS. **2** to **5**.

Referring to the segment **210***a*, the front wall **214** may be in the form of an elongate malleable plate, such as an aluminum plate, that extends vertically lengthwise up from a first end of the bottom wall **218**. The end wall **216** may have a similar form, and extends vertically up from a second end of the bottom wall **218** is also an elongate plate. As discussed above, it will be appreciated that the use of the directional terms "vertical", "top", "bottom", etc. refers to directions with respect to the mounting of lighting assembly **100** as shown in FIG. **7**, wherein the bottom wall **114** is disposed on extends horizontally along horizontal support surface, such as the cove base **18'** of the cove **12'** of FIG. **7**.

The front wall **214** of the segment **210** is coupled to the front wall **214** of the adjacent segment **210***b* by at least one flexible hinge **230***a*, **230***b*, which may suitably be the same in form and function as the flexible hinges **130***a*, **130***b*. The flexible hinge **230***a* is connected at the tops of the back walls **214** of the segments **210***a*, **210***b*, and the flexible hinge **230***b* is connected at the bottoms of the back walls **214** of the segments **210***a*, **210***b*. The flexible hinges **230***a*, **230***b* define a vertical axis b of relative rotation or pivotal movement between the segment **210***a* and the segment **210***b*. The flexible hinges **230***a*, **230***b* may suitably have the same flex properties as those described above in connection with the hinges **130***a*, **130**.

All of the segments **210***a*, **210***b*, **210***c* . . . **210***n* are connected to each other by similar flexible hinges. As a result, all of the segments **210***a*, **210***b*, **210***c* . . . **210***n* are capable of relative pivotal or rotational movement about vertical axes parallel to the vertical axes b shown in FIG. **6**. By contrast, the end walls **216** and the bottom walls **218** of the segments **210***a*, **210***b*, **210***c* . . . **210***n* are not connected to each other in order to allow them to rotate with respect to each other about the vertical axes. The relative rotational angle between each set of adjacent segments **210***a*, **210***b*, **210***c* . . . **210***n* may be different, or the same. As a result, the bracket **202** may be flexed in many ways, including moderately tight curves, S-curves, etc.

As with the bracket **102**, the segments **210***a*, **210***b*, **210***c* . . . **210***n* and hinges **230***a*, **230***b* in this embodiment are formed from a single sheet of metal. The segments **210***a*, **210***b*, **210***c* . . . **210***n* all have substantially the same structure, but may have different through hole patterns or other surface features.

In this embodiment, the lamp modules **205***a*, **205***b*, **205***c* are disposed serially (or end-to-end) along and within the U-shaped channel formed by the adjacent segments **210***a*, **210***b*, **210***c* of the bracket **202**. In this embodiment, each lamp module **205***a*, **205***b*, **205***c* is generally in the form of rectangular box, and includes a front wall **220***a*, a rear wall **222***c*, and a bottom section **220***c*, **222***b*.

Referring the lamp module **205***a* by way of example, in this embodiment, each lamp module **205***a*, **205***b*, **205***c* includes a first frame **220** and a second frame **222**. The first frame **220** includes the front wall **220***a*, an angled surface **220***b*, and a portion **220***c* of the bottom section **220***c*, **222***b*. The second frame **222** includes the rear wall **222***c*, and the other portion **222***b* of the bottom section **220***c*, **222***b*. The bottom portions **220***c*, **222***b*, run parallel to each other to collectively form the bottom of the lamp module **205***a*.

The angled surface **220***b* extends upward and diagonally rearward from the bottom potion **220***c*. The angled surface **220***b* forms a mount for the substrate **204**. As with the flexible substrate **104**, the substrate **204** includes a plurality of LED lamps **240** affixed thereto. The substrate **204** can extend the length of the module **205** and is affixed to the angled surface **220***b* of the first frame **220**. The substrate **204** and lamps **240** may suitably be a flexible LED module available from Luxtech LLC of Philadelphia, Pa. However, in this embodiment, it is not necessary for the substrate **204** to be flexible, since the lamp modules **205***a*, **205***b*, **205***c* do not themselves bend by a significant amount.

Each module **205***b*, **205***c* has a structure similar to that of the lamp module **205***a*. Each module **205***a*, **205***b*, **205***c* is mounted within the bracket **202** such that the individual segments **210***a*, **210***b*, **210***c* . . . **210***n* can rotate or bend partially about axes parallel to the axes b without damaging the corresponding lamp module **205***a*, **205***b*, **205***c*.

Each lens **206** in this embodiment may be a PMMA structure similar to the lens **106**, which passes light. In general, each lens **206** covers a corresponding lamp module **205***a*, **205***b*, **205***c*. To this end, each lens **206** extends lengthwise approximately the length and width of the corresponding lamp module **205***a*, **205***b*, **205***c*. It will be appreciated, however, that the lens **206** in this embodiment need not have the flexibility of the lens **106**.

In use, the bracket **202** may be manually contoured about the axes of rotations of the back walls **214** of the segments **210***a*, **210***b*, **210***c* . . . **210***n*. The lamp modules **205***a*, **205***b*, **205***c* do not necessarily bend, but instead retain their shape within the contoured set of segments **210***a*, **210***b*, **210***c* . . . **210***n* in which they are located. As a result of contouring the bracket **202** to have curves the lamp modules **205***a*, **205***b*, **205***c* can be at skewed angles with respect to each other.

The embodiment of FIGS. **6** and **7** can provide for a different cove lighting effect than that of the embodiment of FIGS. **1** to **5**, and thus has advantages in particular implementations.

It will be appreciated that the above describe embodiments are merely exemplary, and that those of ordinary skill in the art may readily devise their own implementations and modifications that incorporate the principles of the present invention and fall within the spirit and scope thereof.

The invention claimed is:

1. A light fixture assembly, comprising:

a bracket having a plurality of connected segments, each segment having a first wall operably connected to a first wall of an adjacent segment such as to allow relative rotatable movement therebetween, each of at least a first segment and a second segment of the plurality of connected segments having at least a second wall fixedly attached to the first wall;

a substrate having a plurality of lamps affixed thereto, the substrate configured to be disposed within a channel formed by at least the first wall and the second wall; and

a lens configured to be disposed above the substrate within the channel, such that light from the plurality of lamps radiates through the lens;

wherein each of the connected segments includes a third wall extending between the first wall and the second wall, wherein the second wall of each segment is spaced apart from the second wall of an adjacent segment, and wherein the third wall forms a part of the channel; and

wherein the substrate and lens are formed as a first lamp module disposed within the channel, and further comprising at least a further lamp module disposed within the channel, the further lamp module having a further substrate having a further plurality of lamps affixed thereto, and a further lens disposed above the further substrate, such that light from the further plurality of lamps radiates through the further lens.

2. The light fixture assembly of claim 1, wherein the substrate is a flexible substrate coupled to flex correspondingly with flexing of the first segment and the second segment.

3. The light fixture of claim 1, further comprising at least one flexible hinge rotatably coupling the first segment to the second segment to define a select angle of a plurality of configurable angles between the first segment and the second segment.

4. The light fixture of claim 3, wherein the flexible hinge is configured to retain the select angle absent applied external force.

5. The light fixture of claim 3, wherein the first segment, second segment and the at least one flexible hinge are integrally formed together.

6. The light fixture of claim 1, wherein the second wall of the first segment further includes a throughhole for receiving a fastener.

7. The light fixture of claim 1, further comprising at least one flexible hinge rotatably coupling the first segment to the second segment to define a select angle of a plurality of configurable angles between the first segment and the second segment; and wherein the flexible hinge is configured to retain the select angle absent applied external force.

8. The light fixture of claim 1, wherein the first lamp module includes a front wall and a rear wall, and wherein the substrate is disposed between at least indirectly coupled to the front wall and the rear wall.

9. The light fixture of claim 8, wherein the lens extends at least in part between the front wall and the rear wall above the substrate.

10. A light fixture assembly, comprising:

a bracket having a plurality of connected segments, each segment having a first wall operably connected to a first wall of an adjacent segment such as to allow relative rotatable movement therebetween, each of at least a first segment and a second segment of the plurality of connected segments having at least a second wall fixedly attached to the first wall;

a substrate having a plurality of lamps affixed thereto, the substrate configured to be disposed within a channel formed by at least the first wall and the second wall; and

a lens configured to be disposed above the substrate within the channel, such that light from the plurality of lamps radiates through the lens;

at least one flexible hinge rotatably coupling the first segment to the second segment to define a select angle of a plurality of configurable angles between the first segment and the second segment;

wherein the first segment, second segment and the at least one flexible hinge are integrally formed together; and

wherein the at least one flexible hinge includes spaced apart first and second metal connectors between the back wall of the first segment and the back wall of the second segment.

11. A light fixture assembly, comprising:

a bracket having a plurality of connected segments, each segment having a first wall operably connected to a first wall of an adjacent segment such as to allow relative rotatable movement therebetween, each of at least a first segment and a second segment of the plurality of connected segments having at least a second wall fixedly attached to the first wall;

a substrate having a plurality of lamps affixed thereto, the substrate configured to be disposed within a channel formed by at least the first wall and the second wall; and

a lens configured to be disposed above the substrate within the channel, such that light from the plurality of lamps radiates through the lens;

wherein each of the connected segments includes a third wall extending between the first wall and the second wall, wherein the second wall of each segment is spaced apart from the second wall of an adjacent segment, and wherein the third wall forms a part of the channel; and

wherein the substrate and lens are formed as a first lamp module configured to be disposed within the channel, and further comprising at least a further lamp module configured to be disposed within the channel with the first lamp module, the further lamp module having a further substrate having a further plurality of lamps affixed thereto, and a further lens disposed above the further substrate, such that light from the further plurality of lamps radiates through the further lens.

12. The light fixture of claim 11, wherein the second wall of the first segment further includes a throughhole for receiving a fastener.

13. The light fixture of claim 11, further comprising at least one flexible hinge rotatably coupling the first segment to the second segment to define a select angle of a plurality of configurable angles between the first segment and the second segment; and wherein the flexible hinge is configured to retain the select angle absent applied external force.

14. The light fixture of claim 11, wherein the first lamp module includes a front wall and a rear wall, and wherein the substrate is disposed between at least indirectly coupled to the front wall and the rear wall.

15. The light fixture of claim 14, wherein the lens extends at least in part between the front wall and the rear wall above the substrate.

16. The light fixture of claim 14, wherein the first lamp module and the second lamp module are configured to be disposed within the channel such that they extend end-to-end.

17. The light fixture of claim 16, wherein the first lamp module and the second lamp module are configured to be disposed within the channel such that they extend end-to-end in a skewed manner.

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