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(54) **SPRING LOCK CLIP FOR COUPLING A CIRCUIT BOARD TO AN ELECTRICAL BASE**

(71) Applicant: **eLUMIGEN, LLC**, Troy, MI (US)

(72) Inventors: **Gennaro Fedele**, West Bloomfield, MI (US); **Mahendra Dassanayake**, Bloomfield Hills, MI (US); **Brian Petku**, Clarkston, MI (US); **Kevin Nalezyty**, Warren, MI (US); **Christopher Darr**, Livonia, MI (US)

(73) Assignee: **eLUMIGEN, LLC**, Troy, MI (US)

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(58) **Field of Classification Search**
CPC F21K 9/235; F21K 9/238; F21V 23/006; H01R 33/22; H01R 33/94; H01R 33/9453; H01R 33/9456; H01R 43/205
See application file for complete search history.

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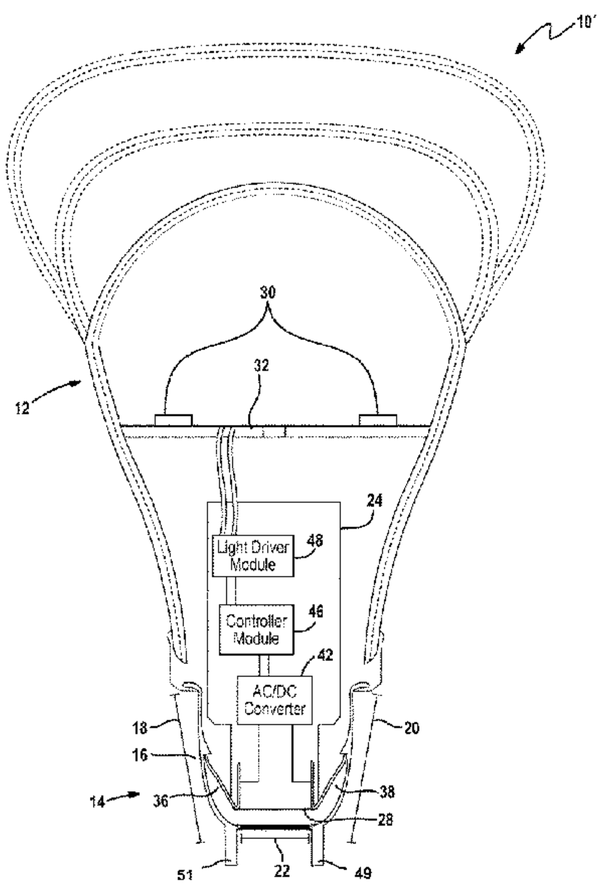
Primary Examiner — James A Menefee

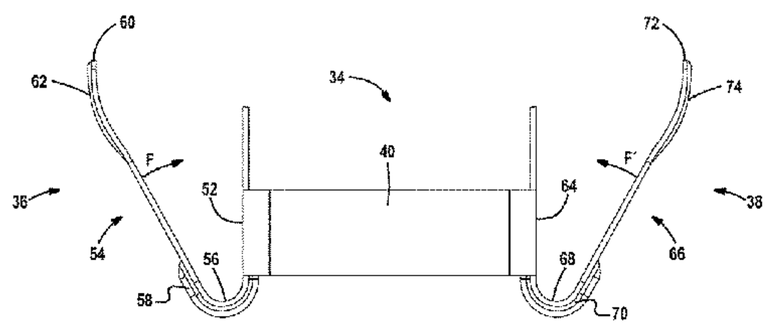
(74) *Attorney, Agent, or Firm* — Harness, Dickey & Pierce, P.L.C.

(57) **ABSTRACT**

An assembly includes a contact interface device, a lamp base and a circuit board. This device is connected to the circuit board and is used to bias the circuit board within the center of a cavity of a light bulb. This device contains two or more biasing portions that are connected to one another through a bridge portion. The biasing portions engage an interior threaded portion of the lamp base in order to lock into place and not allow the circuit board to move. The bridge portion allows the biasing portions to counteract one another and suspend the circuit board in the middle of the cavity of the light bulb.

17 Claims, 11 Drawing Sheets





(51) **Int. Cl.**

H01R 33/22	(2006.01)
F21K 9/235	(2016.01)
H01R 33/945	(2006.01)
H01R 33/94	(2006.01)
F21V 23/00	(2015.01)
H01R 103/00	(2006.01)

(52) **U.S. Cl.**
CPC ***H01R 33/94*** (2013.01); ***H01R 33/9453*** (2013.01); ***H01R 43/205*** (2013.01); *H01R 2103/00* (2013.01)

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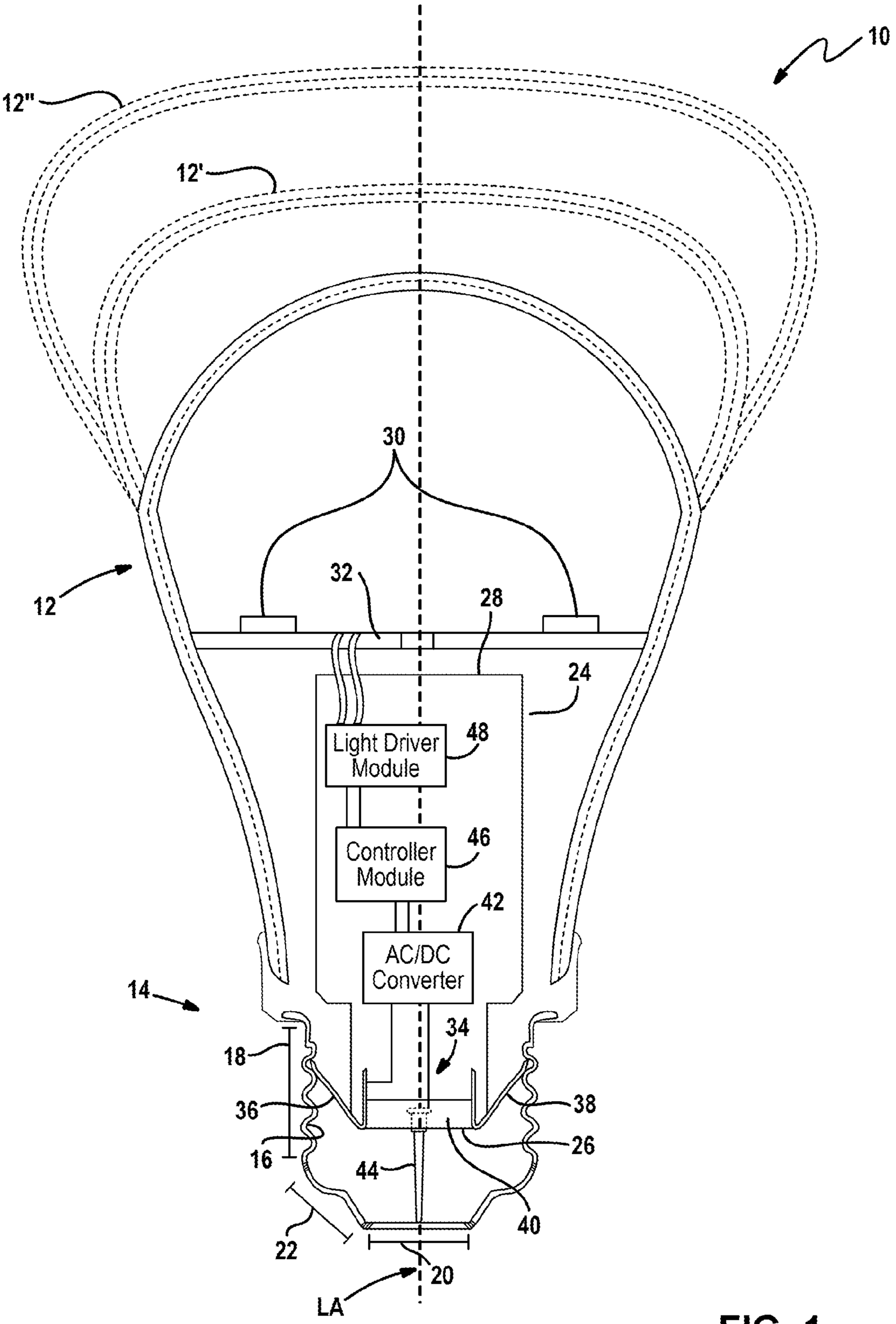

10
12"
12'
30
32
28
12
24
Light Driver Module
48
Controller Module
46
42
AC/DC Converter
14
34
18
36
38
16
26
44
40
22
20
LA

FIG. 1

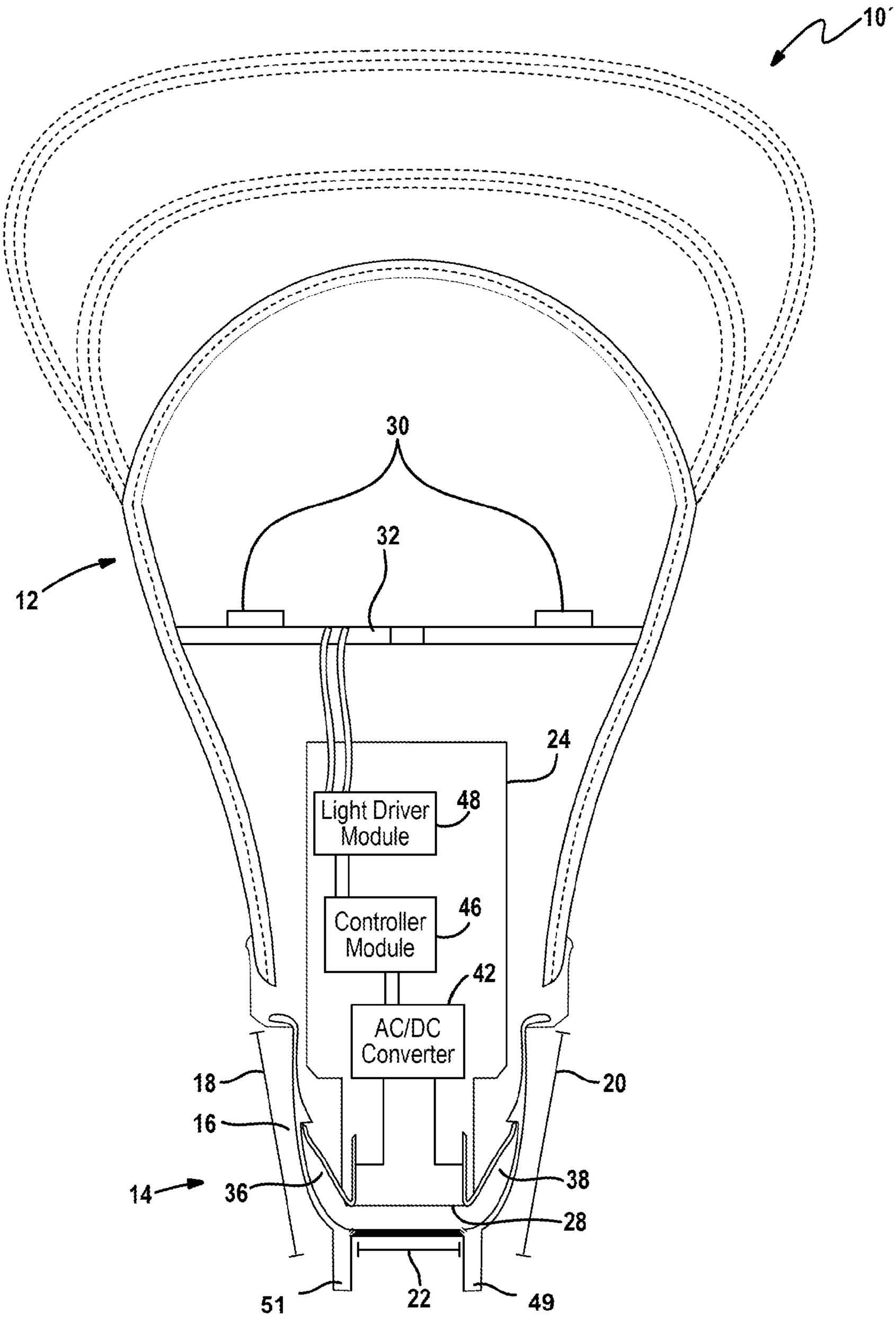

10'
30
32
12
24
Light Driver Module
48
Controller Module
46
42
AC/DC Converter
18
20
16
14
36
38
28
51
22
49

FIG. 2

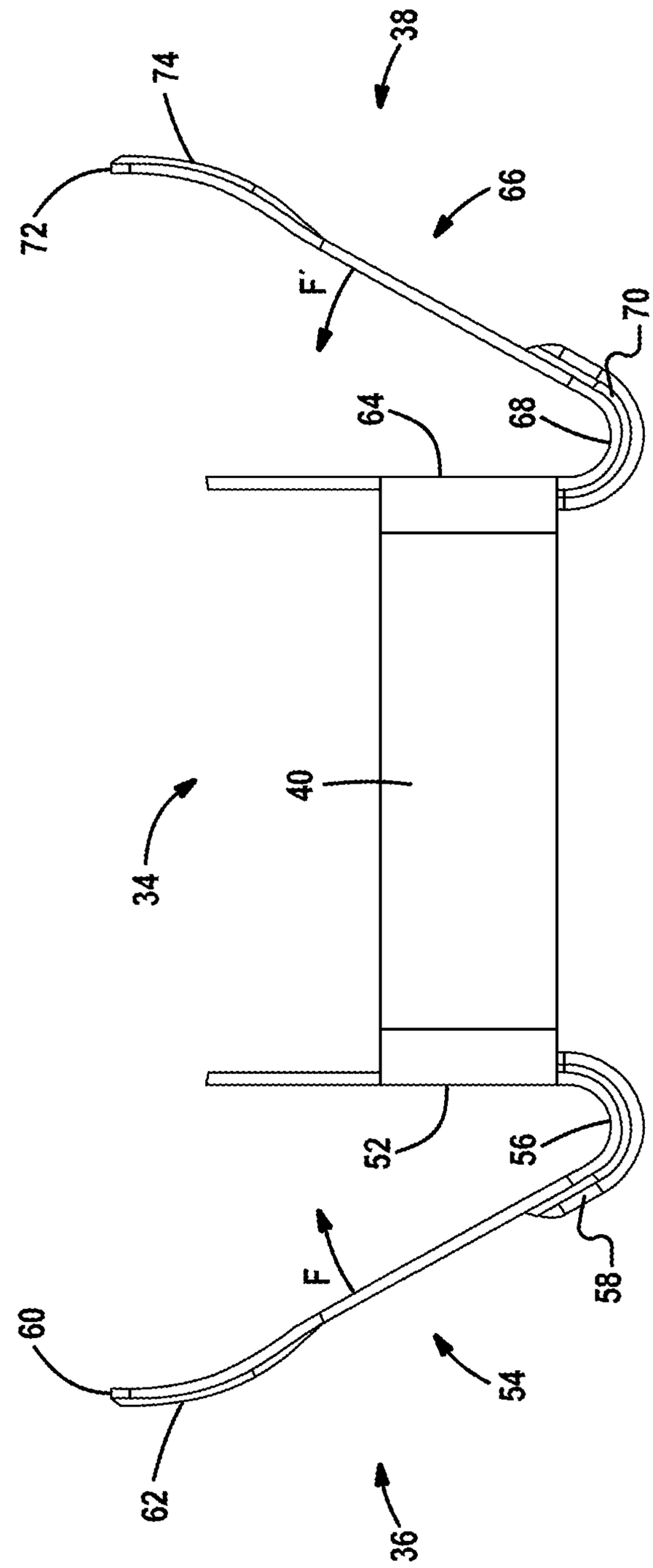


FIG. 3

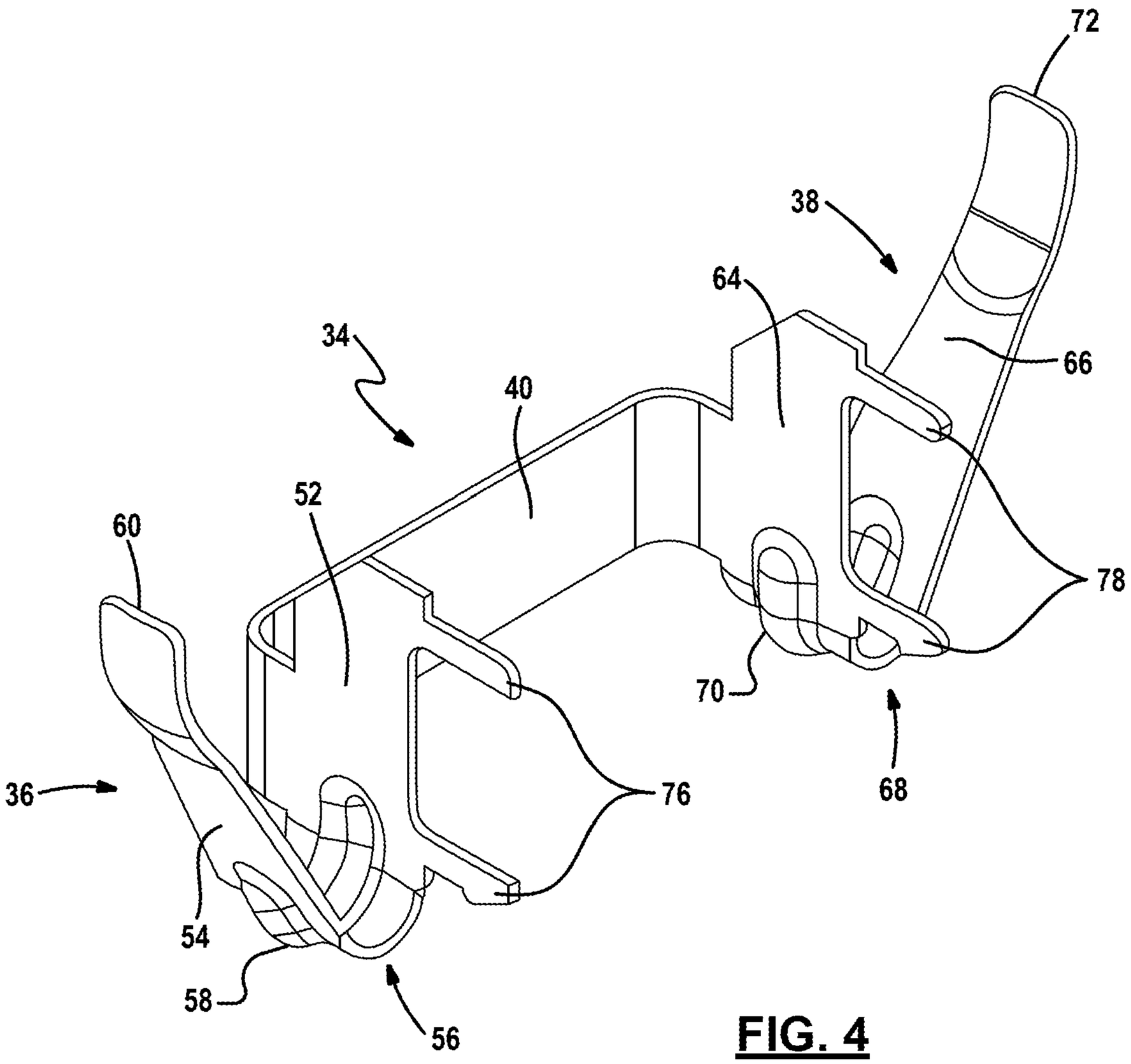


FIG. 4

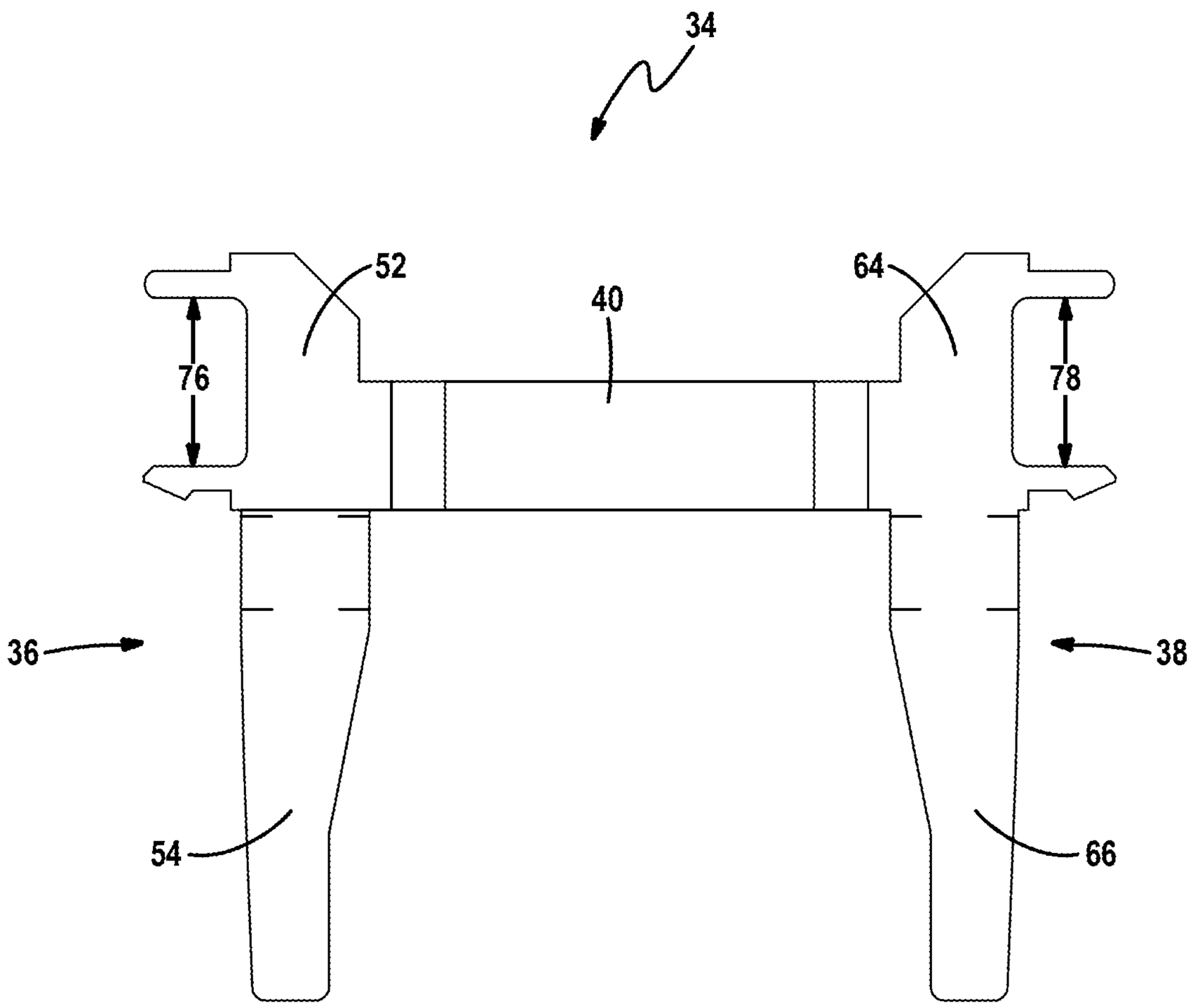


FIG. 5

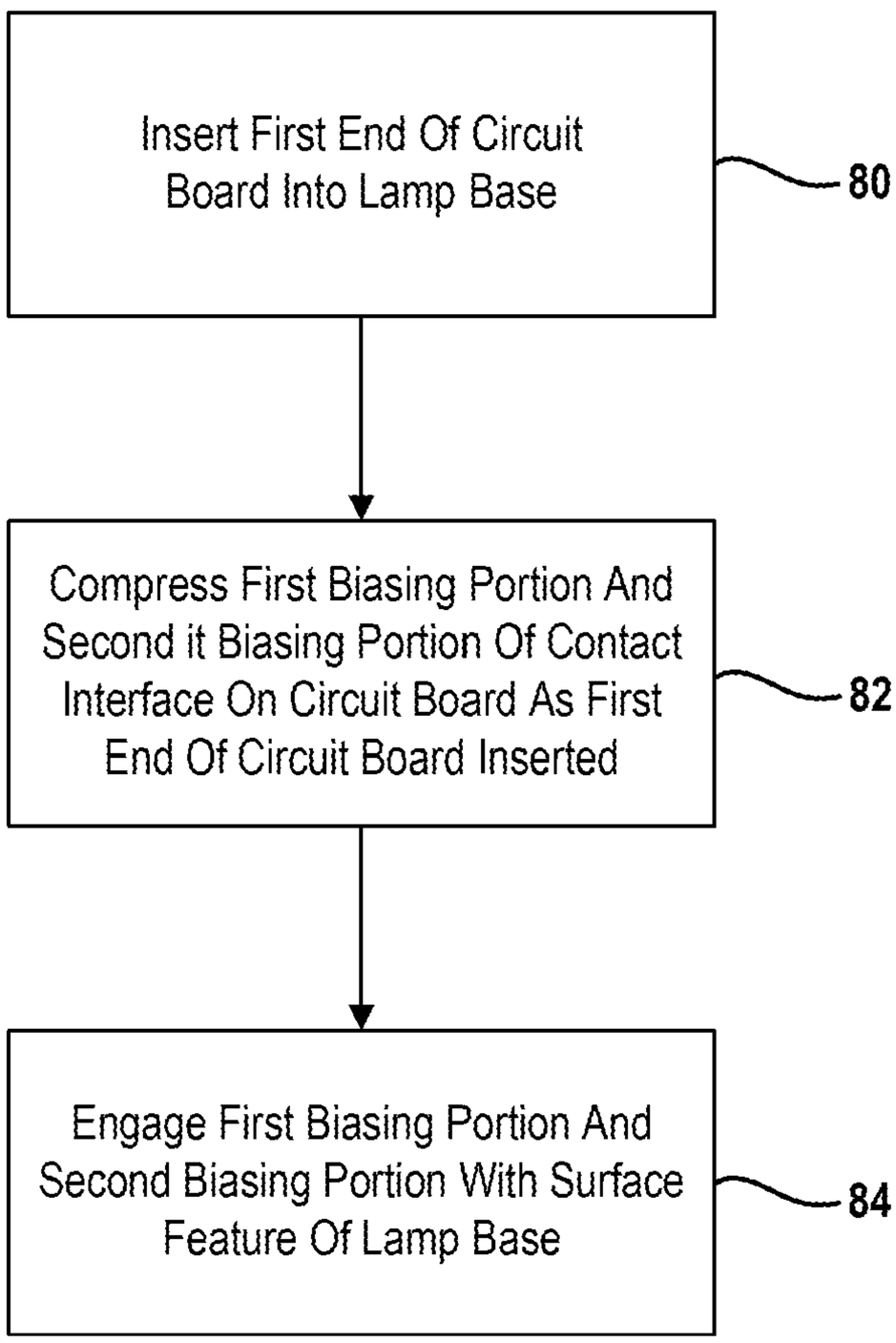

Insert First End Of Circuit Board Into Lamp Base
80
Compress First Biasing Portion And Second it Biasing Portion Of Contact Interface On Circuit Board As First End Of Circuit Board Inserted
82
Engage First Biasing Portion And Second Biasing Portion With Surface Feature Of Lamp Base
84

FIG. 6

FIG. 7A

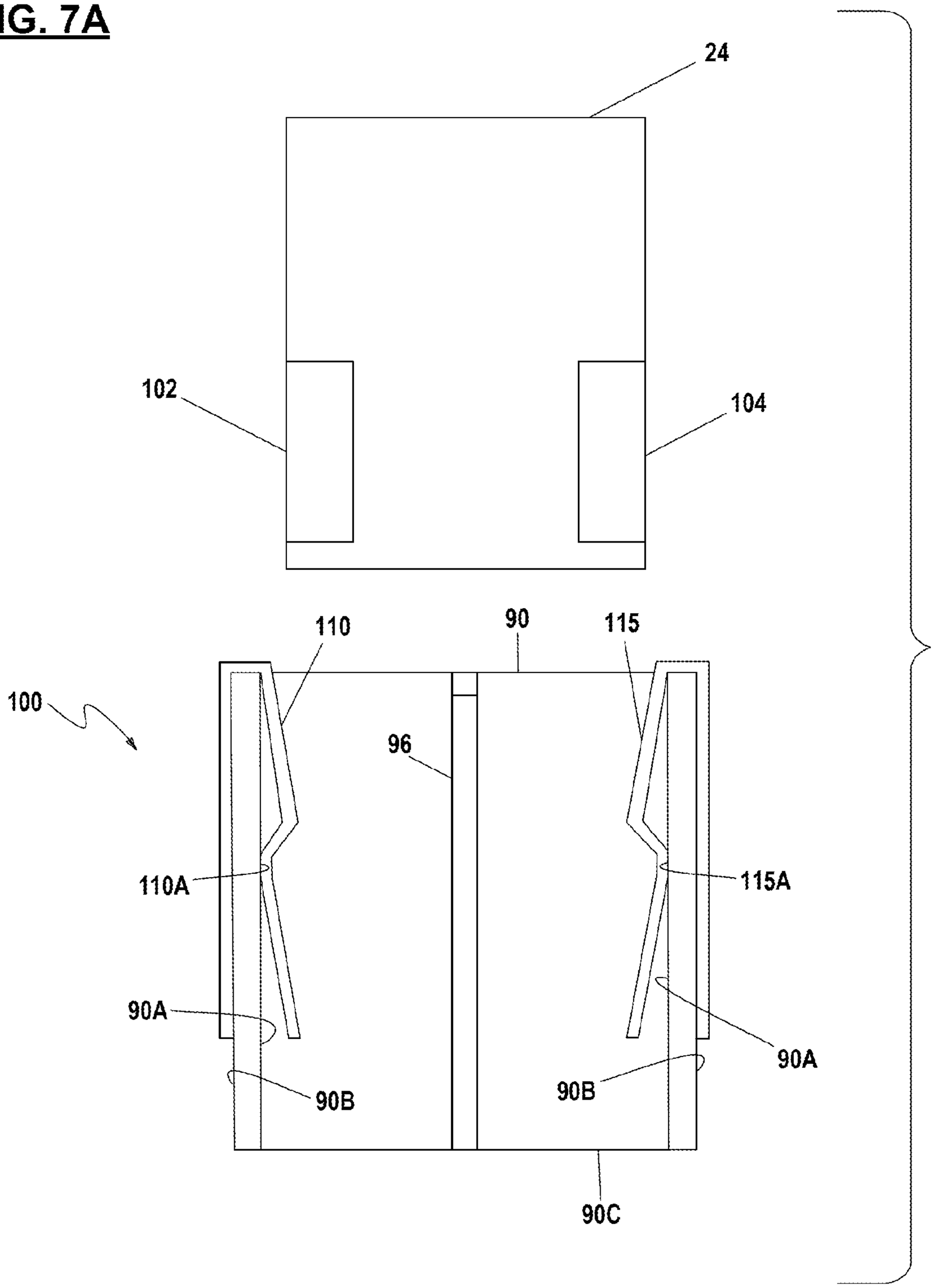
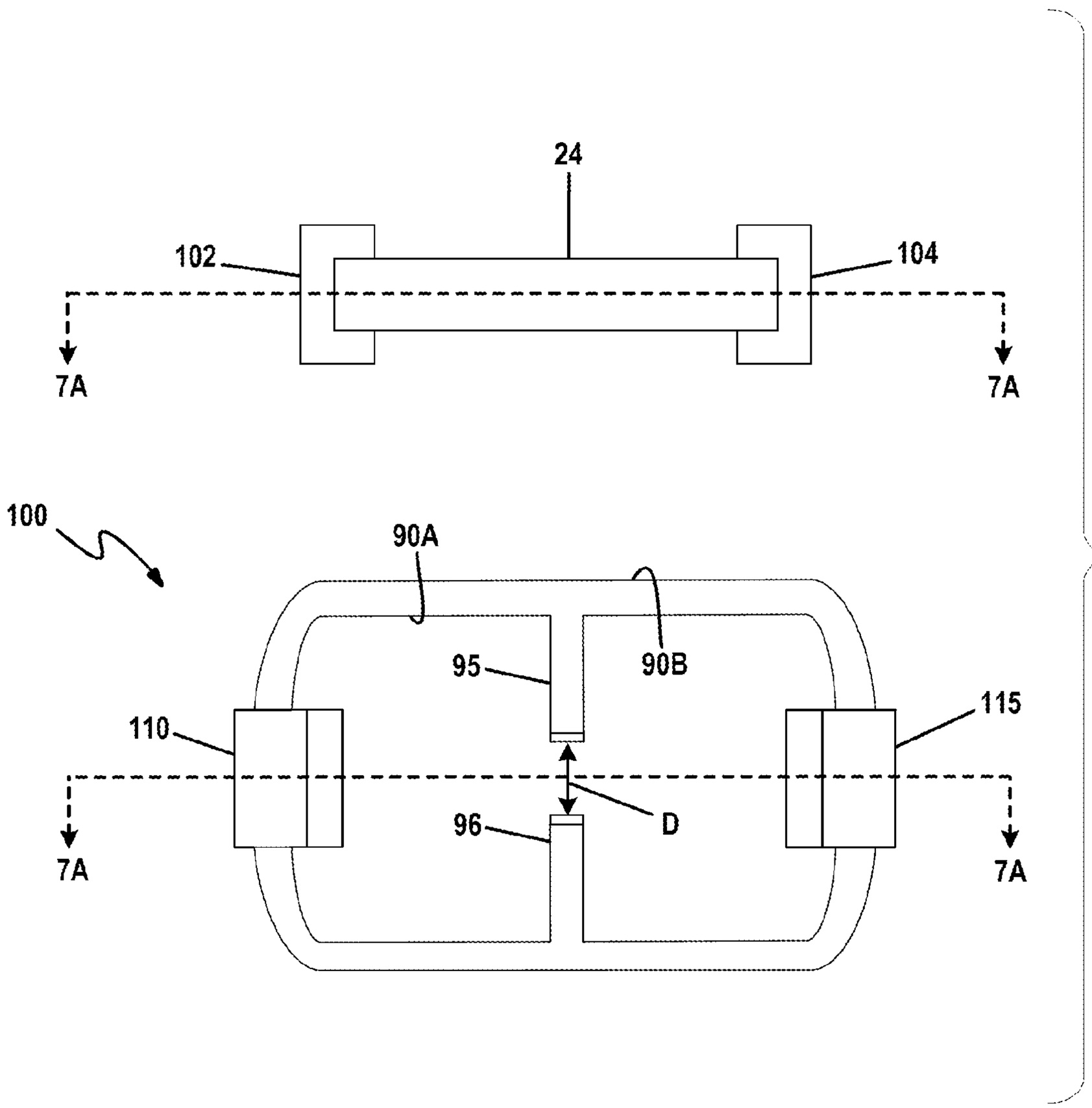


FIG. 7B



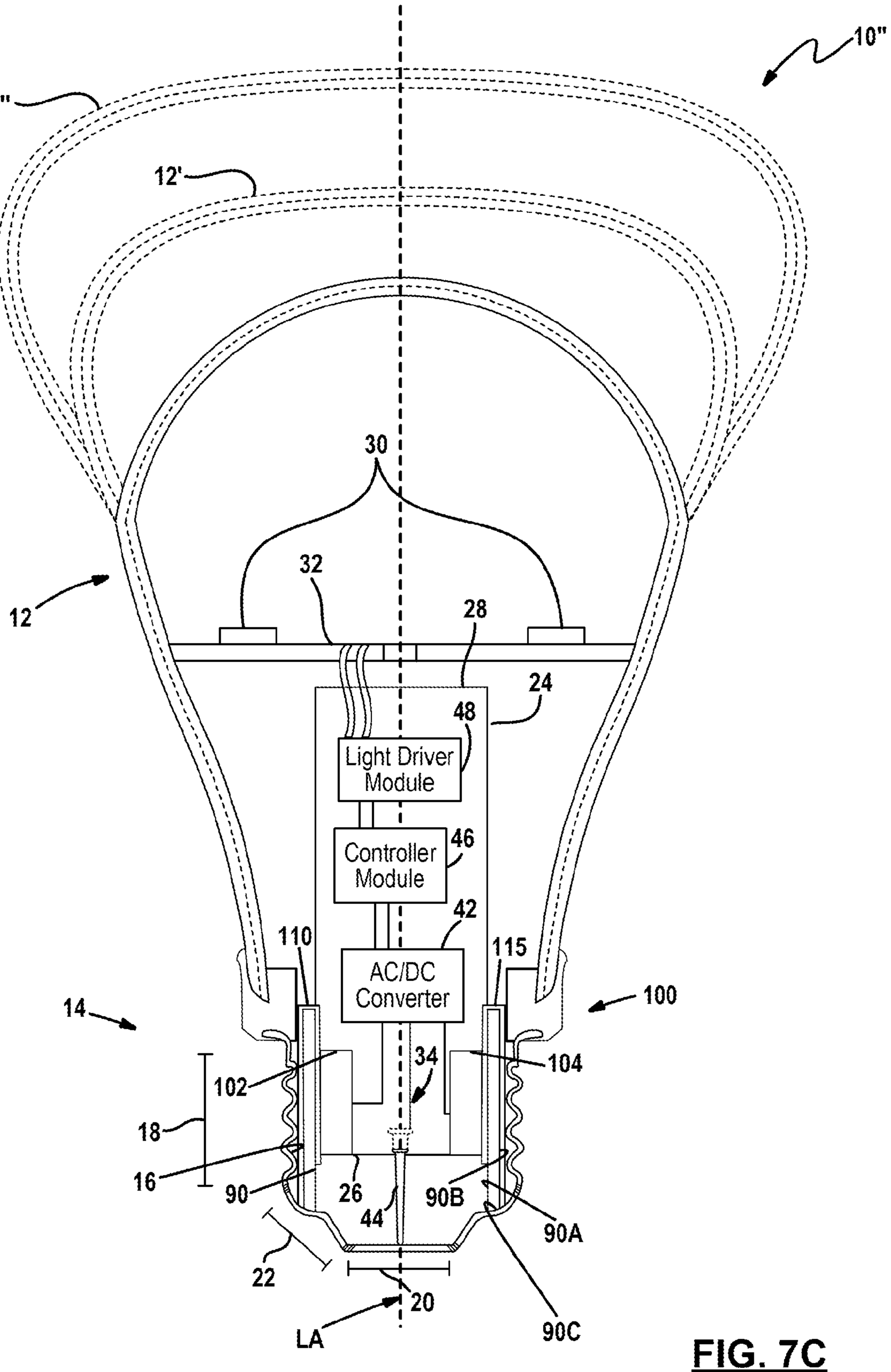

10"
12"
12'
30
32
28
12
24
48
Light Driver Module
46
Controller Module
42
AC/DC Converter
110
115
14
100
34
104
102
18
16
90
26
44
90B
90A
22
20
LA
90C

FIG. 7C

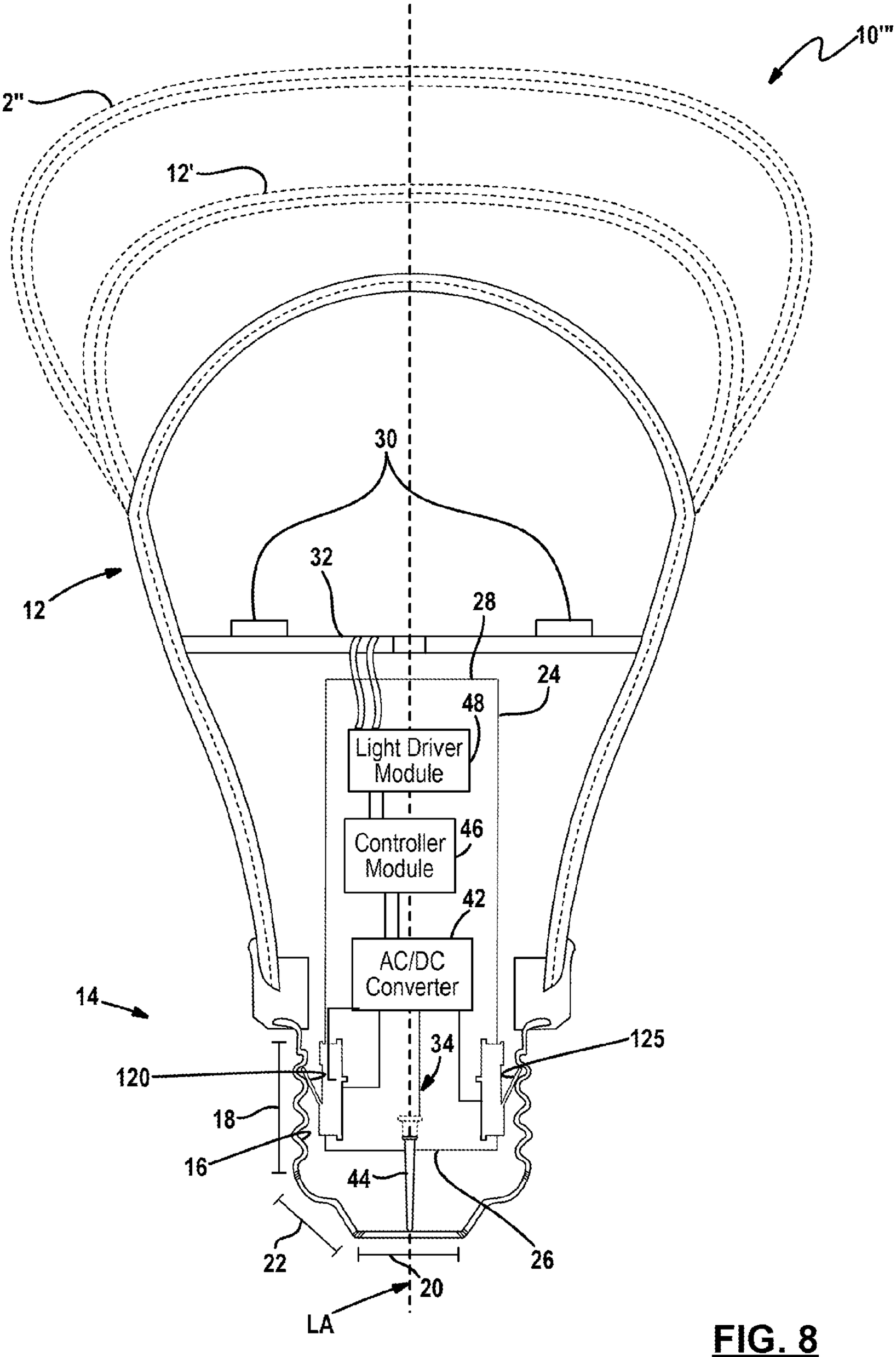

10'''
12''
12'
30
32
28
12
24
48
Light Driver Module
46
Controller Module
42
AC/DC Converter
14
125
120
34
18
16
44
22
26
20
LA

FIG. 8

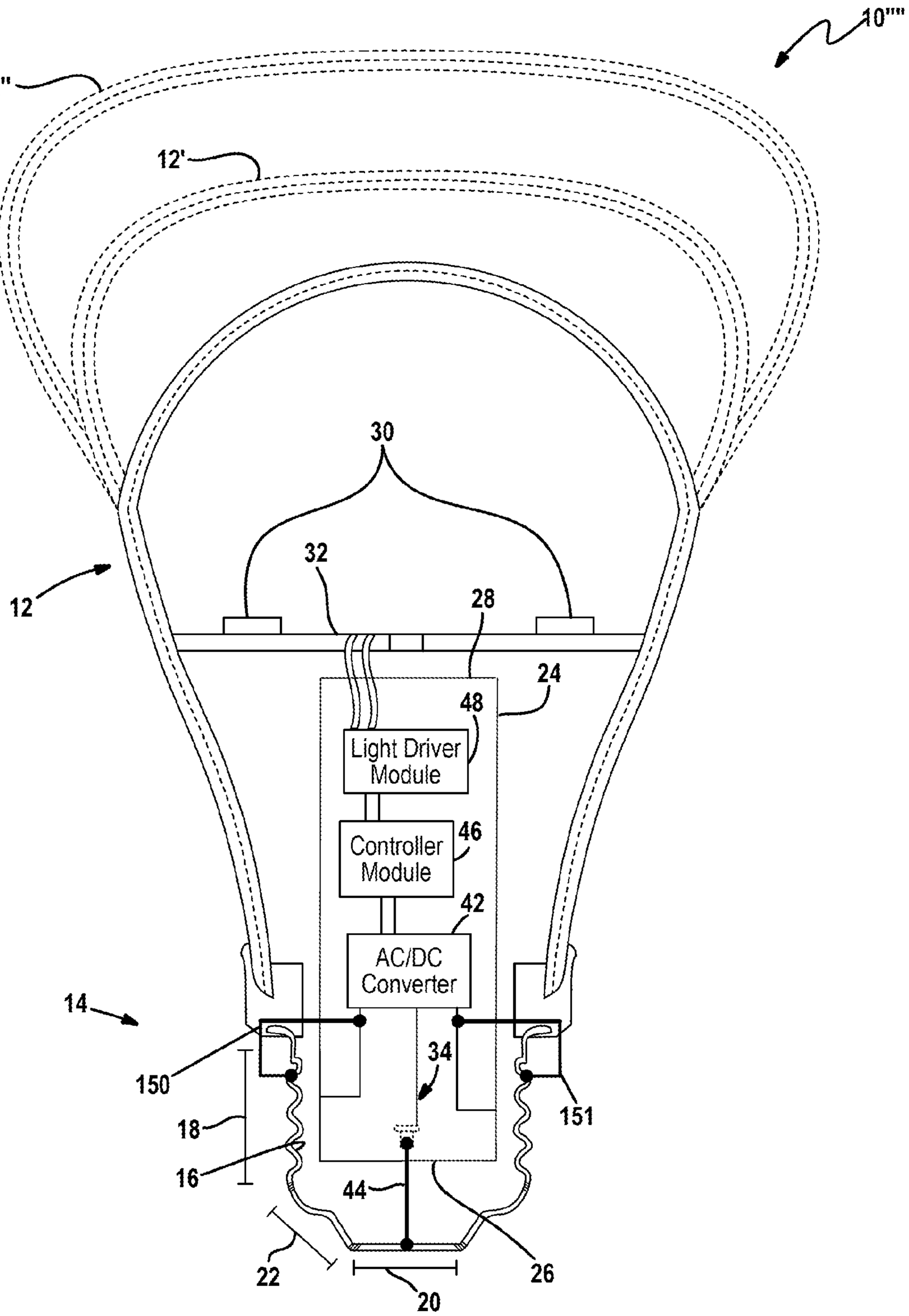

10''''
12''
12'
12
30
32
28
24
48
Light Driver Module
46
Controller Module
42
AC/DC Converter
14
150
151
34
18
16
44
22
20
26

FIG. 9

SPRING LOCK CLIP FOR COUPLING A CIRCUIT BOARD TO AN ELECTRICAL BASE

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates the additions made by reissue; a claim printed with strikethrough indicates that the claim was canceled, disclaimed, or held invalid by a prior post-patent action or proceeding.

CROSS-REFERENCE TO RELATED APPLICATIONS

This application claims the benefit of U.S. Provisional Application No. 62/061,833, filed on Oct. 9, 2014. The entire disclosure of the above application is incorporated herein by reference.

TECHNICAL FIELD

The present disclosure relates generally to a lighting assembly and, more specifically, an apparatus to electrically connect a circuit board with a power source.

BACKGROUND

This section provides background information related to the present disclosure which is not necessarily prior art.

A light bulb has a lamp base and housing. The lamp base is used to electrically connect the light bulb to the light socket. Some lamp bases screw into the light socket, whereas others may be pushed into the light socket or connected in a different way. The housing contains many different parts that are all used together to illuminate desired areas. The housing also has an outward facing portion, the outward facing portion being clear or shaded depending on the desired light output, which exposes the light on the desired area. Some of the parts within the housing include but are not limited to circuitry, wires, mechanical positioning devices and light sources. In order to maintain the functionality of the light, the circuit board (or the electrical conductors therein) is electrically connected to the base. This connection is made, for example, by soldering a wire to connect the electrical lamp base to the circuit board. The circuit board is then be secured within the lamp base so the circuit board cannot shift its position within the light while it is being moved.

In order to lower the manufacture time, a different method of securing the circuit board within the light bulb is set forth in order to increase the efficiency and productivity of the manufacturing process.

SUMMARY

This section provides a general summary of the disclosure, and is not a comprehensive disclosure of its full scope or all of its features.

In one aspect of the disclosure, an assembly comprises a circuit board having a first end and a second end, a lamp base having an interior threaded portion, and a contact interface. The contact interface further includes a first electrically conductive biasing portion, a second electrically conductive biasing portion and a bridge portion. The first electrically conductive biasing portion and second electrically conductive biasing portion engage the interior threaded portion of the lamp base and connect the lamp base and the circuit board. The bridge portion counterbalances a force produced by the first biasing portion and a force produced by the second biasing portion.

In another aspect of the disclosure, a method of forming electrical contacts within a lamp base comprises connecting a contact interface to the surface of a circuit board, where the contact interface has a first electrically conductive biasing portion, a second electrically conducting biasing portion and a bridge portion. A lamp base is then aligned with the circuit board. The circuit board is then inserted in an interior threaded portion of the lamp base to produce an electrical connection from the lamp base through the electrically conductive biasing portions to the circuit board.

Further areas of applicability will become apparent from the description provided herein. The description and specific examples in this summary are intended for purposes of illustration only and are not intended to limit the scope of the present disclosure.

DRAWINGS

FIG. **1** is a cross-sectional view of a first assembly of a light according to the present disclosure.

FIG. **2** is a cross-sectional view of a second assembly of a light according to the present disclosure.

FIG. **3** is a top view of the contact interface.

FIG. **4** is a perspective view of the contact interface.

FIG. **5** is a top view of the contact interface before it has been shaped.

FIG. **6** is a flowchart describing the method of mounting and engaging the contact interface.

FIG. **7**A is a cross-sectional view of a third example light assembly according to the present disclosure.

FIG. **7**B is a top view of a third example light assembly according to the present disclosure.

FIG. **7**C is a cross-sectional view of a third example light assembly according to the present disclosure.

FIG. **8** is a cross-sectional view of a fourth example light assembly according to the present disclosure.

FIG. **9** is a cross-sectional view of a fifth example light assembly according to the present disclosure.

DETAILED DESCRIPTION

The present disclosure will now be described fully herein with references to the accompanying figures, in which the various examples are shown. This disclosure may, however, be embodied in many different forms and should not be limited to the present disclosure, application or uses. For purpose of clarity, the same reference numbers will be used in the drawings to identify similar elements.

It should be noted that in the following figures, various components may be used interchangeably. For example, the circuit board illustrates one of many possible implementations of a light source circuit. This particular circuit board layout is for example purposes only and is not meant to limit the disclosure to this particular implementation.

Referring now to FIG. **1**, a cross-sectional view of the assembly **10** is shown. This assembly includes a lamp base **14** and a housing portion **12**. The lamp base **14** is used to connect the light bulb to the light socket and provide electrical energy to the light bulb. The housing portion **12** may come in different shapes and sizes, depending on the type of lighting conditions desired, the surface area being lit, and the shading or color of the light to be emitted from the light bulb. Alternative housing portions **12'** and **12"** are

illustrated as alternative shapes. The housing may act as a cover to transmit light therethrough.

In one example, the assembly **10** has a circuit board **24** and a contact interface **34**. The circuit board **24** may have a first end **26** and a second end **28**. This circuit board **24** is used to drive light sources **30** from power supplied to the electrical lamp base **14**. The light sources **30** may be mounted on a circuit board **32**. The light sources **30** may be in direct communication with the circuit board **24**, or the light sources **30** may have a separate circuit board **32** positioned within the housing **12** that is in communication with the circuit board **24**. The light sources **30** may be LED light sources, lasers, or any light-emitting device known in the art.

The light assembly has a longitudinal axis LA that extends through the middle of the housing portion **12** and the base **14**.

In this assembly **10**, the circuit board **24** is connected to the base **14** through the contact interface **34**. The contact interface **34** includes a first electrically conductive biasing portion **36** and a second electrically conductive biasing portion **38**. These two separate biasing portions engage an interior threaded portion **16** of the lamp base **14** on opposite sides of the contact interface and suspend the circuit board **24** within the housing portion of the light assembly.

A force that is produced from the contact between the interior threaded portion **16** and the first biasing portion **36** counteracts a force that is produced between the second biasing portion **38** and the interior threaded portion **16** of the base **14** by means of a bridge portion **40** that connects the first biasing portion **36** to the second biasing portion **38**.

The bridge portion **40** may be electrically conductive in order to allow the first biasing portion **36** to be in electrical communication with the second biasing portion **38**. This bridge portion **40** may also be composed of a non-conductive material in order to insulate the first biasing portion **36** from the second biasing portion **38**. This would be in circumstances where the electrical signal from the first biasing portion is different from the electrical signal of the second biasing portion and the points of contact of the respective biasing portions within the lamp base **14** are insulated from one another.

The bridge portion **40** is located on a bridge plane created between the first biasing portion **36** and the second biasing portion **38**. This bridge plane runs parallel to a primary plane created between the first end **26** and second end **28** of the circuit board.

The contact interface **34** may facilitate a connection between the lamp base **14** and an AC/DC converter **42**, which would also have an input from a prong or electrical contact **44** extending from the circuit board **24** to the base **14**. The conductive portion **20** where electrical contact **44** contacts the base **14** is insulated from the parts of the lamp base **14** which are engaged by the first biasing portion **36** and second biasing portion **38** by insulating portion **22**. The bridge portion **40** is suspended above the electrical contact **44**. The AC/DC converter **42** may be in communication with a controller module **46**. This controller module **46** may be used for many purposes, including but not limited to dimming the lights, turning the lights on and off, strobing the lights, setting a timer, etc. This controller module **46** may be in communication with a light driving module **48** which would be in direct communication with the light sources **30**.

Referring now to FIG. **2**, a cross-sectional view of assembly **10'** is shown. This assembly **10'** is similar to the first assembly **10**, with the exception that there is no bridge portion **40**. A non-conducting (electrically) portion **22** separates the two conductive portions **18** and **20** of the base **14**. A pair of contacts **49** and **51** may conduct different polarities or have different voltages.

Referring now to FIG. **3**, the contact interface **34** is shown in greater detail from a top-view. The first biasing portion **36** may be divided in two separate sections; a first mounting portion **52** and a first engaging portion **54**. The first mounting portion **52** extends perpendicular from the bridge portion **40**. This first mounting portion **52** is used to electrically connect and mount the first biasing portion **36** to the circuit board **24**. The first mounting portion **52** and the first engaging portion **54** are flexibly coupled. The first engaging portion **54** may flex in the direction F. The connection forms a V-shape between the first engaging portion **54** and the first mounting portion **52** at a first corned joint **56**. The first corner joint **56** may have more than one surface contour **58** in order to aid in stability and make the shaping of the first biasing portion **36** easier in the manufacturing process.

The first engaging portion **54** has a first end **60** that may be in communication with the interior threaded portion of the base. The first end **60** and a second end, which is where the first engaging portion **54** is connected to the first mounting portion **52**, form a first engaging plane that runs perpendicular to the primary plane and the bridge portion **40**. The first engaging portion **54** may also have a first engaging bend **62**. The first engaging bend **62**, which bends first end **60** inward towards the bridge portion **40**, may be used to allow a better contact between the first end **60** and the interior threaded portion of the lamp base. This is due to the engaging portion having better leverage against the threads of the lamp base.

Similarly, the second biasing portion **38** may also be divided into two separate sections; a second mounting portion **64** and a second engaging portion **66**. The second mounting portion **64**, like the first mounting portion **52**, is used to electrically connect and mount the second biasing portion **38** to the circuit board **24**. The second mounting portion **64** is also flexibly connected to the second engaging portion **66**. That is, the second engaging portion may flex as indicated by arrow F'. This connection forms a V-shape between the second engaging portion **66** and the second mounting portion **64**, and also forms a second corner joint **68**. The second corner joint **68** may also have more than one surface contour **70** in order to aid in stability and make the shaping of the second biasing portion easier in the manufacturing process.

The second engaging portion **66** has a first end **72** that may be in communication with the interior threaded portion of the base. The first end **72** and a second end, which is where the second engaging portion **66** is connected to the second mounting portion **64**, form a second engaging plane that runs perpendicular to the primary plane and the bridge portion **40**. The second engaging portion **66** may also have a second engaging bend **74**. The second engaging bend **74**, which bends the first end **72** inward towards the bridge portion **40**, may be used to allow a better contact between the first end **72** and the interior threaded portion of the lamp base.

The first engaging bend **62** and the second engaging bend **74** may also allow the contact interface **34** to sit tighter within the lamp base due to the first engaging portion and second engaging portion having a more stable contact end.

Referring now to FIG. **4**, a perspective view of the contact interface **34** is shown. The first mounting portion **52** has pins **76** for mounting to a circuit board. In a similar fashion, the second mounting portion **64** shows a means of attaching using pins **78**. This particular view shows two sets of pins **76**

and **78** being used, but a singular pin may be used on both sides or plurality of pins may be used.

Referring now to FIG. **5**, a top view of the contact interface **34** before it has been shaped is shown. This view shows that the first biasing portion **36**, second biasing portion **38** and bridge portion **40** can be formed as a unitary structure. This unitary structure may be stamped using a die and a flat sheet of contact interface material. The stamped structure can then be bent into the desired shape. The contact interface **34** would need to be bent or shaped and attached to the circuit board.

Referring now to FIG. **6**, a flowchart is shown that describes a method of mounting and engaging the contact interface. This method begins by connecting the contact interface to the circuit board. Once the contact interface is connected to the circuit board, the circuit board and the lamp base may be aligned with one another so that the area where the contact interface is connected to the circuit board may be inserted to the interior portion the lamp base. When the circuit board is aligned with the lamp base, the circuit board may be inserted into the interior portion of the lamp base to allow the first biasing portion **36** and the second biasing portion **38** to engage the interior portion of the lamp base. Once the circuit board is inserted into the lamp base, the circuit board and lamp base are then inserted into the housing portion of the light assembly.

In step **80**, the contact interface **34** may be mounted on the circuit board **24** by means of first soldering pins **76** and **78** to the circuit board **24**. The pins **76** and **78** may be connected to the circuit board using a different method other than soldering, such as crimping, using connectors, or any other method to produce an electrical connection.

In step **82**, once the contact interface **34** is connected to the circuit board **24**, the circuit board **24** may then be held by a machine while the lamp base **14** is aligned with the circuit board **24**.

In step **84**, the method of inserting the circuit board into the base may be press-fitting into the interior of the lamp base to produce electrical contacts through the separate biasing portions. Steps **82** and **84** state inserting the circuit board into the base, then inserting the circuit board and base into the interior housing portion of the light bulb, but this order may be reversed depending on manufacturing needs and ease.

Referring now to FIGS. **7**A-**7**C, a cross-sectional view of a third example light subassembly is shown according to the present disclosure. Elements with the same reference numbers in assembly **10"** are functionally the same as those in assembly **10**.

The third example comprises a subassembly **100** that includes a frame **90**, a first biasing portion **110**, and a second biasing portion **115**. The first biasing portion **110** may be in contact with an inner surface **90**A and an outer surface **90**B of the frame **90**. The second biasing portion **115** may be in contact with the inner surface **90**A and the outer surface **90**B of the frame **90**. The first biasing portion **110** may be configured in a manner that allows for a flat portion **110**A of the first biasing portion **110** to contact the inner surface **90**A of the frame **90** when the circuit board **24** is not inserted into the subassembly **100**. The second biasing portion **115** may be configured in a manner that allows for a second flat portion **115**A of the second biasing portion **115** to contact the inner surface **90**A of the frame **90** when the circuit board **24** is not inserted into the subassembly **100**. Once the circuit board is inserted into the subassembly **100**, the first biasing portion **110** and the second biasing portion **115** will have its entire surface in contact with the inner surface **90**A of the frame **90**, as described below.

In this example, the circuit board **24** comprises a first portion of a metal clip **102** and a second portion of a metal clip mounted to the circuit board. Once the circuit board **24** is inserted into the subassembly **100**, the first portion of the metal clip **102** is electrically coupled to the first biasing portion **110**. The second portion of the metal clip **104** is electrically coupled to the second biasing portion **115** once the circuit board **24** is inserted into the subassembly **100**.

Referring now to FIG. **7**B, a top view of the third example light assembly is shown according to the present disclosure. Elements with the same reference numbers in assembly **10"** are functionally the same as those in assembly **10**.

In this example, a first guide piece **95** and a second guide piece **96** may extend perpendicularly from the inner surface **90**A of the frame **90**. The first guide piece **95** and the second guide piece **96** may be separated by a predetermined distance D, such that the predetermined distance D is slightly larger than the thickness of the circuit board **24**. Thus, the circuit board **24** can be inserted into the subassembly **100** between the first guide piece **95** and the second guide piece **96**. The predetermined distance D may be chosen so that the circuit board **24** can securely maintain its position within the subassembly **100**.

Referring now to FIG. **7**C, a cross-sectional view of the third example light assembly **10"** is shown according to the present disclosure. Elements with the same reference numbers in assembly **10"** are functionally the same as those in assembly **10**.

The base **14** has the first conductive portion **18** and the second conductive portion **20** in different positions on the base **14**. The first conductive portion **18** conducts the first voltage from the light socket or receptacle to assembly **10"**. Similarly, the second conductive portion **20** conducts the second voltage from the light socket or receptacle to the assembly **10"**. The non-conductive portion **22** insulates the first conductive portion **18** from the second conductive portion **20**.

Once the circuit board **24** is inserted into the subassembly **100**, the circuit board **24** will force the entire surface of the first biasing portion **110** and the second biasing portion **115** each to contact the inner surface **90**A of the frame **90**. The frame **90** may have a flat base portion **90**C that is in contact with the non-conductive portion **22** of the base **14**.

When the circuit board **24** is inserted into the subassembly **100**, the first portion of the metal clip **102** of the circuit board **24** is electrically coupled to the first conductive portion **18** through the first biasing portion **110** by engaging the surface feature such as the interior threaded portion **16** of the base **14**. The second portion of the metal clip **104** of the circuit board **24** is electrically coupled to the first conductive portion **18** through the second biasing portion **115** by engaging the interior threaded portion **16** of the base **14**. The circuit board **24** also is electrically coupled to the second conductive portion **20** through the electrical contact **44**. The electrical contact **44** may be connected to the second conductive portion **20** by soldering the electrical contact **44** to the second conductive portion **20** or by using a compliant pin to make the connection.

Referring now to FIG. **8**, a fourth example of a cross-sectional view of assembly **10'"** is shown using two soldered metal clips. Elements with the same reference numbers in assembly **10'"** are functionally the same as those in assembly **10**.

The base **14** has the first conductive portion **18** and the second conductive portion **20** in different positions on the

base **14**. The first conductive portion **18** conducts the first voltage from the light socket or receptacle to assembly **10'''**. Similarly, the second conductive portion **20** conducts the second voltage from the light socket or receptacle to the assembly **10'''**. The non-conductive portion **22** insulates the first conductive portion **18** from the second conductive portion **20**.

In this example, a first biasing portion **120** and a second biasing portion **125** are implemented using two metal clips that are soldered to the circuit board **24**. Thus, when the circuit board **24** is inserted into the base **14**, the first biasing portion **120** and the second biasing portion **125** are electrically coupled to the first conductive portion **18** by engaging the surface feature **16** of the base **14**. The circuit board **24** also becomes electrically coupled to the second conductive portion **20** through the electrical contact **44**. The electrical contact **44** may be connected to the second conductive portion **20** by soldering the electrical contact **44** to the second conductive portion **20** or by using a compliant pin to make the connection.

Referring now to FIG. **9**, a fifth example of a cross-sectional view of assembly **10''''** is shown using wire contacts. Elements with the same reference numbers in assembly **10''''** are functionally the same as those in assembly **10**.

The base **14** has the first conductive portion **18** and the second conductive portion **20** in different positions on the base **14**. The first conductive portion **18** conducts the first voltage from the light socket or receptacle to assembly **10**. Similarly, the second conductive portion **20** conducts the second voltage from the light socket or receptacle to the assembly **10''''**. The non-conductive portion **22** insulates the first conductive portion **18** from the second conductive portion **20**.

In this example, the first conductive portion **18** may be electrically coupled to the circuit board **24** by soldering a wire **150** at the interior threaded portion **16** of the base **14** and at the circuit board **24**. An additional wire **151** may be soldered at the interior threaded portion **16** of the base **14** and at the circuit board **24** so that the first conductive portion **18** may be engaged. The electrical contact **44** may be implemented by soldering an additional wire at the first end **26** of the circuit board **24** and by soldering the additional wire **151** to the second conductive portion **20**.

The foregoing description of the examples has been provided for purposes of illustration and description. It is not intended to be exhaustive or to limit the disclosure. Individual elements or features of a particular example are generally not limited to that particular example, but, where applicable, are interchangeable and can be used in a selected example, even if not specifically shown or described. The same may also be varied in many ways. Such variations are not to be regarded as a departure from the disclosure, and all such modifications are intended to be included within the scope of the disclosure.

What is claimed is:

1. An assembly comprising:

a circuit board having a first end and a second end, said circuit board disposed in a primary plane;

a lamp base having an interior **[**threaded**]** portion;

a contact interface comprising a first solder pin and a second solder pin that are soldered to the circuit board to fixedly couple the contact interface to the circuit board, said contact interface including:

a first electrically conductive biasing portion engaging the interior **[**threaded**]** portion of the lamp base and connecting the lamp base and the circuit board though the first solder pin;

a second electrically conductive biasing portion engaging the interior **[**threaded**]** portion of the lamp base and connecting the lamp base and the circuit board through the second solder pin; and

a bridge portion coupling the first electrically conductive biasing portion and the second electrically conductive biasing portion and counterbalancing a force produced by the first biasing portion and a force produced by the second biasing portion, and wherein the bridge portion is mounted to create a bridge plane between the first biasing portion and the second biasing portion which extends parallel to the primary plane; and

a conductive contact extending from the circuit board to the lamp base at a point electrically insulated from the interior **[**threaded**]** portion of the lamp base, wherein the bridge portion is suspended at a distance from the conductive contact to insulate the conductive contact from the bridge portion.

2. The assembly as described in claim **1**, wherein connecting comprises electrically connecting and mechanically suspending the circuit board within the lamp base.

3. The assembly as described in claim **1**, wherein the assembly further comprises a light source in communication with the circuit board.

4. The assembly as described in claim **1** where the bridge portion is electrically conductive.

5. The assembly as described in claim **4**, wherein the first biasing portion, the bridge portion and the second biasing portion are all formed as a unitary structure, wherein the first biasing portion, bridge portion and second biasing portion are in electrical communication.

6. The assembly as described in claim **5**, wherein the unitary structure is formed by means of stamping a die on a flat sheet of conductive material.

7. The assembly as described in claim **1**, wherein the first biasing portion further comprises:

a first mounting portion extending perpendicular to the primary plane; and

a first engaging portion having a first end in contact with the interior **[**threaded**]** portion of the lamp base and a second end connected to the first mounting portion, wherein the first end and the second end form a first engaging plane extending perpendicular to the primary plane.

8. The assembly as described in claim **7**, where the first engaging portion and the first mounting portion are flexibly attached and form a V-shape.

9. The assembly as described in claim **[1]** *7*, wherein the second biasing portion further comprises:

a second mounting portion extending perpendicular to the primary plane; and

a second engaging portion having a first end in contact with the interior **[**threaded**]** portion of the lamp base and a second end connected to the second mounting portion, wherein the first end and the second end form a second engaging plane extending perpendicular to the primary plane.

10. The assembly as described in claim **9** where the second engaging portion and the second mounting portion are flexibly attached and form a V-shape.

11. An assembly comprising:

a circuit board having a first end and a second end, said circuit board disposed in a primary plane;

a lamp base having an interior **[**threaded**]** portion;

a contact interface fixedly coupled to the circuit board, said contact interface including:

a first electrically conductive biasing portion engaging the interior [threaded] portion of the lamp base and connecting the lamp base and the circuit board;

a second electrically conductive biasing portion engaging the interior [threaded] portion of the lamp base and connecting the lamp base and the circuit board; and

a bridge portion, composed of a non-conductive material, coupling the first electrically conductive biasing portion and the second electrically conductive biasing portion and counterbalancing a force produced by the first biasing portion and a force produced by the second biasing portion, and wherein the bridge portion is mounted to create a bridge plane between the first biasing portion and the second biasing portion which extends parallel to the primary plane; and

a conductive contact extending from the circuit board to the lamp base at a point electrically insulated from the interior [threaded] portion of the lamp base, wherein the bridge portion is suspended at a distance from the conductive contact to insulate the conductive contact from the bridge portion.

12. The assembly as described in claim **11**, wherein the bridge portion electrically insulates the first biasing portion from the second biasing portion.

13. A method of forming electrical contacts within a lamp base comprising:

connecting a contact interface comprising a first solder pin and a second solder pin that are soldered to the circuit board to fixedly couple the contact interface to the circuit board, said contact interface further comprising a first electrically conductive biasing portion, a second electrically conductive biasing portion and a bridge portion coupled to a surface of a circuit board so that the bridge portion is mounted to create a bridge plane between the first biasing portion and the second biasing portion which extends parallel to [the] *a* primary plane *of the circuit board* and a conductive contact extending from the circuit board to the lamp base at a point electrically insulated from the interior [threaded] portion of the lamp base, wherein the bridge portion is suspended at a distance from the conductive contact to insulate the conductive contact from the bridge portion;

aligning a lamp base with the circuit board;

inserting the circuit board in an interior [threaded] portion of the lamp base to produce an electrical connection from the lamp base through the electrically conductive biasing portions to the circuit board; and

inserting the circuit board and the base into the interior of a housing portion of a light bulb.

14. The method of claim **13**, [wherein the bridge portion connects] *further comprising connecting* the first biasing portion and the second biasing portion *with the bridge portion* to counterbalance a *first* force produced by the first biasing portion and a *second* force produced by the second biasing portion.

15. The method of claim **[13]** *14*, wherein [mounting] *connecting the first biasing portion* comprises electrically connecting and mounting.

16. The method of claim **15**, [wherein] *further comprising electrically conducting through* the bridge portion [is electrically conductive and allows for] *to allow* electrical communication between the first electrically conductive biasing portion and the second electrically conductive biasing portion.

17. A method of forming electrical contacts within a lamp base comprising:

connecting a contact interface having a first electrically conductive biasing portion, a second electrically conductive biasing portion and a bridge portion to a surface of a circuit board so that the bridge portion is mounted to create a bridge plane between the first biasing portion and the second biasing portion which extends parallel to [the] *a* primary plane *of the circuit board* and a conductive contact extending from the circuit board to the lamp base at a point electrically insulated from the interior [threaded] portion of the lamp base, wherein the bridge portion is suspended at a distance from the conductive contact to insulate the conductive contact from the bridge portion and

wherein the bridge portion electrically insulates the first electrically conductive biasing portion from the second electrically conductive biasing portion;

aligning a lamp base with the circuit board;

inserting the circuit board in an interior [threaded] portion of the lamp base to produce an electrical connection from the lamp base through the electrically conductive biasing portions to the circuit board; and

inserting the circuit board and the base into the interior of a housing portion of a light bulb.

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