



(22) Date de dépôt/Filing Date: 2017/02/08

(41) Mise à la disp. pub./Open to Public Insp.: 2017/08/08

(30) Priorité/Priority: 2016/02/08 (US15/018,458)

(51) Cl.Int./Int.Cl. *F21V 14/06* (2006.01),
F21K 9/00 (2016.01), *F21V 21/08* (2006.01),
F21V 31/00 (2006.01), *F21V 5/00* (2015.01)

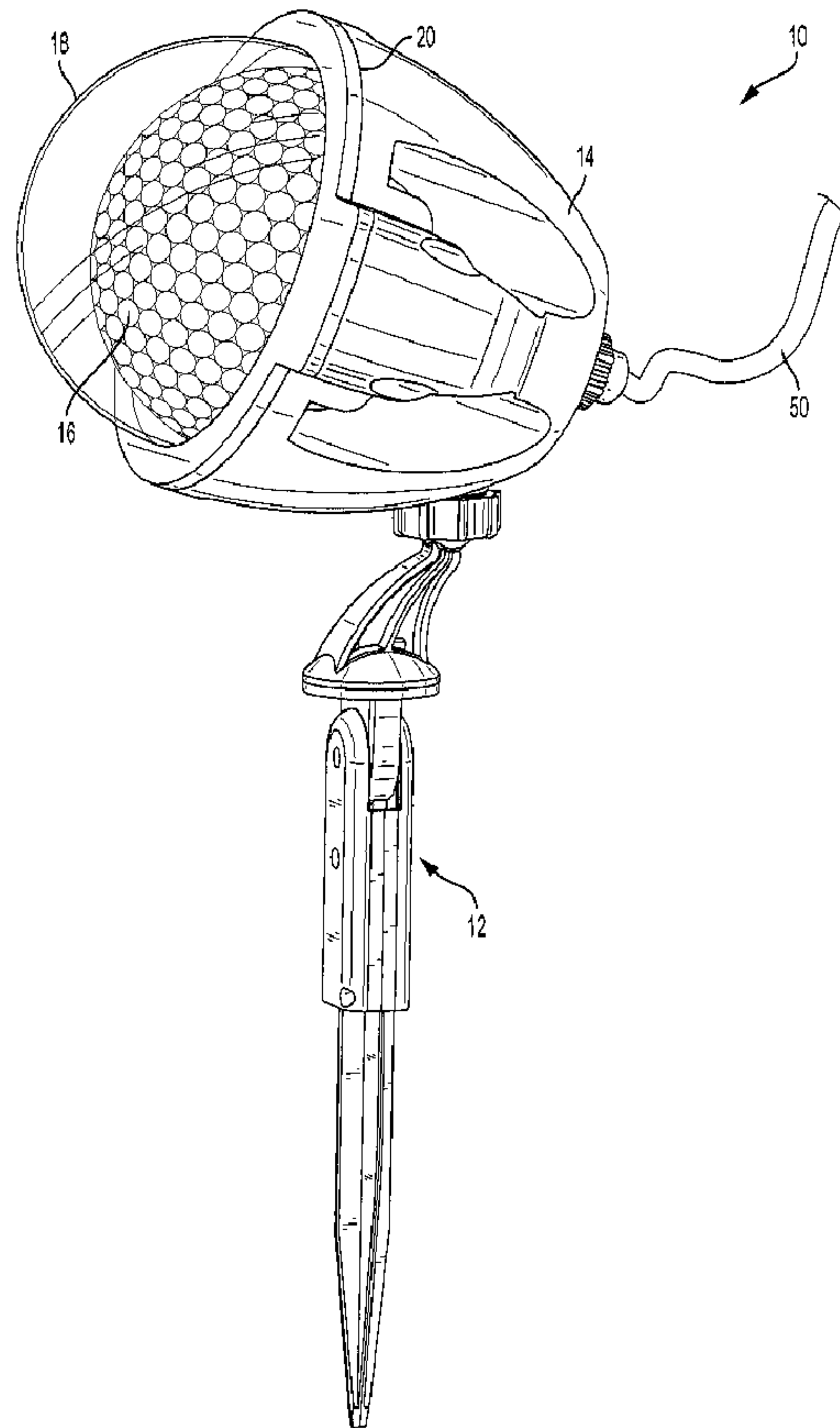
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(54) Titre : LUMIERE DECORATIVE

(54) Title: DECORATIVE LIGHT



(57) Abrégé/Abstract:

A decorative light can include: a lamp case defining a hollow interior region and having an open front end; a beam splitter located inside the lamp case, the beam splitter defining an interior region; a lighting module located within the interior region of the beam



(57) **Abrégé(suite)/Abstract(continued):**

splitter, the lighting module including a plurality of light emitting diodes (LEDs) located thereon; a motor located inside the lamp case, the motor coupled to the beam splitter and adapted to rotate the beam splitter with respect to the lighting module; and a front lens mounted to the open front end of the lamp case. A convertible support stand for an outdoor lighting product is also discussed.

ABSTRACT

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A decorative light can include: a lamp case defining a hollow interior region and having an open front end; a beam splitter located inside the lamp case, the beam splitter defining an interior region; a lighting module located within the interior region of the beam splitter, the lighting module including a plurality of
10 light emitting diodes (LEDs) located thereon; a motor located inside the lamp case, the motor coupled to the beam splitter and adapted to rotate the beam splitter with respect to the lighting module; and a front lens mounted to the open front end of the lamp case. A convertible support stand for an outdoor lighting product is also discussed.

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DECORATIVE LIGHT

TECHNICAL FIELD

[0001] The present application relates generally to a decorative light,
5 such as a decorative outdoor spotlight, and related methods. More specifically,
the present application relates to a decorative outdoor spotlight that has a
dynamic lighting effect, and related methods.

BACKGROUND

10 [0002] Lighting is often used during the holidays, such as Christmas
or Halloween, to decorate a person's house or yard. For example, a person may
install one or more decorative outdoor spotlights on their yard to project
decorative patterns onto their house, trees, or decorations. Examples of
decorative outdoor spotlights are described in Applicant's co-owned U.S.
15 Patent No. 9,068,726 and U.S. Patent Application Publication No. 2015-
0159842, the entire contents of which are incorporated herein by reference.

SUMMARY

[0003] According to an embodiment, a decorative light can comprise:
20 a lamp case defining a hollow interior region and having an open front end; a
beam splitter located inside the lamp case, the beam splitter defining an interior
region; a lighting module located within the interior region of the beam splitter,
the lighting module including a plurality of light emitting diodes (LEDs)
located thereon; a motor located inside the lamp case, the motor coupled to the
25 beam splitter and adapted to rotate the beam splitter with respect to the lighting
module; and a front lens mounted to the open front end of the lamp case.

[0004] According to another embodiment, a convertible support
stand for an outdoor lighting product can comprise: a head adapted to connect

to the outdoor lighting product; a primary post extending from the head; and first and second auxiliary posts connected to the primary post by a hinge mechanism. The first and second auxiliary posts can move between a collapsed position wherein the first and second auxiliary posts are substantially adjacent to, and extend substantially parallel to, the primary post, and an expanded position wherein each of the first and second auxiliary posts extends away from the primary post at an angle to define a tripod shape.

BRIEF DESCRIPTION OF THE DRAWINGS

10 **[0005]** The foregoing aspects and other features and advantages of the invention will be apparent from the following drawings, wherein like reference numbers generally indicate identical, functionally similar, and/or structurally similar elements.

15 **[0006]** FIG. 1 is a perspective view of a decorative light according to an embodiment of the present application, shown with a support base in a collapsed configuration.

[0007] FIG. 2 is a perspective view of the decorative light of FIG. 1, shown with the support base in an expanded configuration.

[0008] FIG. 3 is a side view of the decorative light of FIG. 1.

20 **[0009]** FIG. 4 is a rear view of the decorative light of FIG. 1.

[00010] FIG. 5 is an exploded view of the decorative light of FIG. 1.

[00011] FIG. 6 is a perspective view of the decorative light of FIG. 1, shown with portions removed to reveal internal features.

25 **[00012]** FIG. 7 is a perspective view of a remote control for use with the decorative light of FIG. 1.

[00013] FIG. 8 is a side view of the support base of FIG. 1.

[00014] FIG. 9 is an exploded view of the support base of FIG. 8.

DETAILED DESCRIPTION

[00015] Embodiments of the invention are discussed in detail
5 below. In describing embodiments, specific terminology is employed for the
sake of clarity. However, the invention is not intended to be limited to the
specific terminology so selected. A person skilled in the relevant art will
recognize that other equivalent parts can be employed and other methods
developed without departing from the spirit and scope of the invention. All
10 references cited herein are incorporated by reference as if each had been
individually incorporated.

[00016] Referring to FIGS. 1-4, an embodiment of a decorative
light 10 according to the present invention is shown. FIGS. 1, 3, and 4 depict
perspective, side, and rear views of the decorative light 10, respectively. In
15 FIGS. 1, 3, and 4, the decorative light 10 includes a support base 12 in a
collapsed configuration. FIG. 2 depicts a perspective view of the decorative
light 10, with the support base 12 in an expanded configuration. The
decorative light 10 can be used inside or outside to provide decorative effects.
For example, the structures described below provide decorative light 10 with
20 the ability to project a dynamic (e.g., moving) pattern of multi-colored light
beams. One or more of the decorative lights 10 can be used to provide
dynamic lighting of a persons's house, landscaping, outdoor decorations, or the
like.

[00017] Still referring to FIGS. 1-4, the decorative light 10 can
25 include a lamp case 14, a beam splitter 16 located inside the lamp case 14, and
a front lens 18 mounted to the lamp case 14, for example, to an open front end
20. The lamp case 14 can be made of plastic or other suitable material, such as

metal. The beam splitter 16 and/or front lens 18 can also be formed from plastic or other suitable material and, according to embodiments, are transparent or translucent. The major components of the base 12 can also be made of plastic or other suitable material, and are described in more detail
 5 below.

[00018] Referring to FIGS. 5 and 6, the interior components of the decorative light 10 are shown. The lamp case 14 can define a hollow interior region 22 that houses the various internal components of the light. The lamp case 14 can terminate in an open front end 20, which, according to
 10 embodiments, defines a perimeter that lays within a reference plane. The beam splitter 16 and a lighting module 24, both described in more detail below, can be housed within the lamp case 14. A motor 26, power supply 28, and control unit 30 can also be housed within the lamp case 14. The front lens 18 is coupled to the open front end 20 of the lamp case 14, for example, using
 15 screws or other fasteners, adhesives, snap connections, or other fastening techniques known to one of skill in the art. The front lens 18 can form a watertight seal with the lamp case 14, for example, through the use of a rubber gasket 32 disposed between the front lens 18 and open front end 20, however, other known structures can be used to provide a waterproof seal.

20 [00019] The beam splitter 16 can define a hollow interior region 32 (see cutaway view of FIG. 6) that can house the lighting module 24. The motor 26 can be configured to rotate the beam splitter 16 while the lighting module 24 remains stationary within the interior region 32, creating a dynamic lighting effect. For example, the motor 26 can be located to the side of the beam
 25 splitter 16, and can include an output spindle 34 (see FIG. 6) that engages the beam splitter 16. An axle 36 (see FIG. 7) can be mounted to the lamp casing 14 on the opposite side of the motor 16, and can have a portion that extends

through a bore in the beam splitter 16. The axle 36 and output spindle 34 can together support the beam splitter 16 for rotation within the lamp case 14. Thus, when the motor 16 is energized, the output spindle 34 can cause the beam splitter 16 to rotate within the lamp case 14, for example, about an axis that is substantially parallel to the reference plane of the open front end 20 of the lamp case 14. According to alternative embodiments, the beam splitter 16 can rotate about a different axis, such as, for example, about an axis substantially perpendicular to the reference plane, or about an axis that is located at an acute angle with respect to the reference plane. As shown in FIG. 5, the motor 26 can be secured within the lamp case 14 using a motor mounting bracket 27 fastened to the lamp case 14 with screws or other fasteners, however, other techniques for securing the motor 26 within the lamp case 14 are also possible.

[00020] Still referring to FIGS. 5 and 6, a lighting module support 38 can be connected to an end of the axle 36 located within the beam splitter 16. The lighting module support 38 can thus remain stationary within the beam splitter 16 during rotation of the beam splitter 16. The lighting module 24 is mounted to the lighting module support 38, for example, using adhesive, screws or other fasteners, or other fastening techniques known in the art. A plurality of light emitting diodes (LEDs) 40, or other light sources, can be mounted to the lighting module 24. All or a portion of the axle 36 can define a hollow interior channel 42 to permit passage of electrical wires from the power source 28, which may be located exterior to the beam splitter 16, to the LEDs located within the beam splitter 16. In operation, each of the LEDs can project the same color light, or alternatively, each LED, or subsets of the LEDs, can display different colors.

[00021] Referring to FIG. 5, the lighting module 24 can include first and second faces 24a, 24b (e.g., separate circuit boards) that are angled with respect to one another, for example, in a prism or pyramid shape. At least one LED 40 can be mounted on each of the faces 24a, 24b, such that the LEDs
 5 40 are angled with respect to one another. This configuration can increase the width of the light beam projected by the lighting module 24, and in turn, the decorative light 10. Although the figures show four LEDs 40, alternative embodiments may have more or fewer LEDs 40 arranged in various patterns and groupings.

10 [00022] Still referring to FIG. 5, the beam splitter 16 can be substantially globe-shaped. As discussed previously, the beam splitter 16 can define a substantially hollow interior region. A plurality of facets can be distributed about the inner and/or outer surface of the beam splitter 16, for example, in order to create a dimpled surface on the beam splitter 16. The
 15 facets can focus the light from the light module 24 into multiple individual beams that travel as the beam splitter 16 rotates with respect to the light module 24. As also shown in FIG. 5, an optional cover 44, which can be substantially transparent or translucent, can surround the beam splitter 16. As shown, the cover 44 can closely conform to the outer shape of the beam splitter 16. As
 20 also shown in FIG. 5, the front lens 18 can be substantially dome shaped, however, other configurations are possible.

[00023] Referring again to FIGS. 5 and 6, the power supply 28 can receive power from an external power source, such as a standard 110V AC power outlet. In this regard, a power cord 50 can extend through lamp case 14,
 25 for example, through a waterproof bushing 52. Although not shown, the power cord 50 can include a conventional plug to couple with the power outlet. Alternatively, the power cord 50 can include a plug to connect to a DC power

source, such as a car battery. The power supply 28 can also provide power, *e.g.*, DC power, to the light module 24, motor 26, and control unit 30, for example, using electrical wires (not shown). In the case where the power supply 28 connects to the AC power source, the control unit can be adapted to

5 convert the AC power from the source into DC power to operate the components of the decorative light 10. The control unit 30 can be used to turn the decorative light on or off, to change the color and/or intensity of light emitted by the various LEDs 40 in the lighting module 24, and to adjust the speed of rotation of the motor 26 and in turn, the beam splitter 16.

10 Accordingly, the control unit 30 can adjust the color(s), patterns, and speed of the light beams emitted by the decorative light 10.

[00024] Referring to FIG. 7, a remote control unit 50 can be provided to remotely operate the decorative light 10. For example, the remote control unit 50 can communicate with the control unit 30 using any number of

15 wireless communication technologies, such as infrared, radio frequency, Wi-Fi, or Bluetooth. As shown in FIG. 7, the remote control unit 50 can include an on/off button 52 to turn the decorative light 10 on or off (*e.g.*, to cause the LEDs to turn on/off, and to simultaneously turn the motor 26 on/off).

Additionally, the remote control unit 50 can include a mode button 54 to

20 change the color pattern, intensity, speed, and other characteristics of the light beams emitted by the decorative light 10. Although not shown, user-operable controls can be located on the exterior of the decorative light 10 to perform the same or similar functions described above in connection with the remote control unit 50. These controls can be in addition to, or an alternative to, the

25 remote control unit 50.

[00025] Referring to FIGS. 8 and 9, the support base 12 is shown separated from the decorative light 10. Although the support base 12 can be

used to support the decorative light 10, it can alternatively be used to support another type of outdoor lighting product, or even another type of product altogether, such as a speaker, microphone stand, camera, or video recorder.

The support base 12 can convert between a collapsed configuration (see FIGS.

5 1, 8) and an expanded configuration (see FIGS. 2, 9). In the collapsed configuration, the support base 12 can have the shape of a tapered post (or “spike”) that can be implanted into the ground or other soft surface to maintain the support base 12 and the outdoor product attached thereto in a stable, upright position. In the expanded configuration, the constituent parts of the tapered
10 post can be expanded into a substantially tripod shape in order to support the support base 12 and the outdoor product attached thereto in a stable position above the ground or a hard surface. Various components of the support base 12 can be constructed from plastic, composite, metal, or other material known in the art.

15 **[00026]** Referring to FIGS. 8 and 9, the support base 12 can include a head 60 that connects the support base 12 to the decorative light 10, for example, by connecting to a portion 62 of the decorative light 10 (e.g., a portion of the lamp case 14). For example, the head can include a ball joint utilizing a ball 64 and encapsulating nut 66 to provide adjustment of the
20 decorative light with respect to the support base about multiple axes. One of skill in the art will understand, however, that other types of connections can be used to couple the support base to the decorative light.

[00027] The support base 12 can also include a primary post 68, as well as first and second auxiliary posts 70, 72. The primary post 68 can be
25 coupled to the head 60, and the auxiliary posts 70, 72 can in turn be coupled to the primary post 68, as shown, however other configurations are possible. The primary post 68 and first and second auxiliary posts 70, 72 fit together in a

“collapsed position” to form the shape of a tapered post, or spike, as shown in FIG. 8. In this position, portions of the auxiliary posts 70, 72 are substantially adjacent to the primary post 68, and extend substantially parallel to the primary post 68. As shown in FIG. 9, the primary post 68 can comprise first and second portions 68a, 68b that fit together, for example in a clamshell configuration, and define a pocket 74 that can receive a portion of each of the auxiliary posts 70, 72. A pivot joint 76 can be located between the head 60 and the primary post 68 in order to provide additional adjustability. The pivot joint 76 can comprise a boss 78 secured through a bore 80 in the primary post 68, however, other configurations are possible.

[00028] Referring to FIG. 9, the auxiliary posts 70, 72 can move between the collapsed position and an “expanded position” (e.g., where they form a substantial tripod shape in conjunction with the primary post 68) using a multi-axis hinge mechanism. For example, the hinge mechanism can comprise a first hinge 82 connected to the primary post 68, e.g., via a boss 84. The first hinge 82 can pivot with respect to the primary post 68 about a first axis. A second hinge 86 can be located on the first hinge 82, and can connect the first and second auxiliary posts 70, 72 to the first hinge 82. The second hinge 86 provides for pivoting of the auxiliary posts 70, 72 about a second axis that is substantially perpendicular to the axis of the first hinge 82. Accordingly, the first and second auxiliary posts 70, 72 can pivot with respect to one another between a position where they abut one another (e.g., when in the collapsed position), and a position where they are angled with respect to one another about the second hinge 86 (e.g., when in the expanded position). An elastic member, such as spring 88, can be associated with the second hinge 86 to normally bias the auxiliary posts 70, 72 away from one another.

[00029] To position the support base 12 in the collapsed configuration, the first and second auxiliary posts 70, 72 are folded towards one another, e.g., about the second hinge 86 and against the force of the spring 88, until they abut one another. The auxiliary posts 70, 72 are then rotated as a unit about the first hinge 82 until the combined auxiliary posts 70, 72 abut the primary post 68. At this point, the support base 12 is in the collapsed configuration. In this configuration, a portion of each auxiliary post 70, 72 is received within the pocket 74 in the primary post 68, preventing the auxiliary posts 70, 72 from splaying outward under the force of the spring 88. A detent (not shown) can be provided on the primary post 68, and/or on at least one of the auxiliary posts 70, 72, to resist rotation of the auxiliary posts 70, 72 away from the primary post 68 about the first hinge 82. To move the support base 12 to the expanded configuration (e.g., in the substantial shape of a tripod), the auxiliary posts 70, 72 are pivoted away from the primary post 68 as a unit, about the first hinge 82. Once the auxiliary posts 70, 72 have cleared the pocket 74, the auxiliary posts 70, 72 can then splay away from one another about the second hinge 86, whereby the primary post 68 and auxiliary posts 70, 72 define a substantial tripod shape.

[00030] According to an aspect of the invention, embodiments of the light described herein can be incorporated into an inflatable display of the type described in Applicant's U.S. Patent Application Publication No. 2015-0184844, the entire contents of which are incorporated herein by reference. According to another aspect of the invention, embodiments of the light described herein can be arranged into a light string as described in Applicant's U.S. Patent Application Publication No. 2015-0163876, the entire contents of which are incorporated herein by reference.

[00031] The embodiments illustrated and discussed in this

specification are intended only to teach those skilled in the art the best way known to the inventors to make and use the invention. Nothing in this specification should be considered as limiting the scope of the present invention. All examples presented are representative and non-limiting. The
5 above-described embodiments of the invention may be modified or varied, without departing from the invention, as appreciated by those skilled in the art in light of the above teachings. It is therefore to be understood that, within the scope of the claims and their equivalents, the invention may be practiced otherwise than as specifically described.

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The Claims:

1. A decorative light, comprising:
 - a lamp case defining a hollow interior region and having an open front
 - 5 end;
 - a beam splitter located inside the lamp case, the beam splitter defining an interior region;
 - a lighting module located within the interior region of the beam splitter, the lighting module including a plurality of light emitting diodes (LEDs)
 - 10 located thereon;
 - a motor located inside the lamp case, the motor coupled to the beam splitter and adapted to rotate the beam splitter with respect to the lighting module; and
 - a front lens mounted to the open front end of the lamp case.
- 15 2. The decorative light of claim 1, further comprising a power supply located inside the lamp case, the power supply adapted to connect to an external power source, wherein the power supply is electrically connected to the lighting module and the motor.
- 20 3. The decorative light of claim 1, further comprising a control unit located within the lamp case, the control unit adapted to control the color, intensity, and/or on-off state of at least one of the plurality of LEDs.
- 25 4. The decorative light of claim 3, wherein the control unit is further adapted to control the speed and/or on-off state of the motor.

5. The decorative light of claim 3, further comprising a remote controller adapted to remotely operate the control unit.
6. The decorative light of claim 1, wherein the beam splitter is
5 substantially globe shaped.
7. The decorative light of claim 1, wherein the interior region of the beam splitter is substantially hollow.
- 10 8. The decorative light of claim 1, wherein the beam splitter defines an outer surface covered with multiple facets.
9. The decorative light of claim 1, wherein the beam splitter defines an inner surface covered with multiple facets.
- 15 10. The decorative light of claim 1, wherein the front lens forms a watertight seal with the open front end of the lamp case.
11. The decorative light of claim 1, wherein at least one of the beam splitter
20 or the front lens is substantially transparent or translucent.
12. The decorative light of claim 1, wherein the open front end of the light case defines a reference plane, and the motor is adapted to rotate the beam
25 splitter about an axis of rotation that is substantially parallel to the reference plane.

13. The decorative light of claim 1, wherein the motor is offset to the side of the beam splitter.
14. The decorative light of claim 1, wherein the lighting module includes a first face having at least one of the plurality of LEDs mounted thereon, and a second face having at least one of the plurality of LEDs mounted thereon, wherein the first face is angled with respect to the second face.
15. The decorative light of claim 1, further comprising a support stand coupled to the light case, the support stand convertible between a collapsed configuration wherein the support stand defines a tapered post, and an expanded configuration wherein the support stand defines a tripod.
16. A convertible support stand for an outdoor lighting product, comprising:
a head adapted to connect to the outdoor lighting product;
a primary post extending from the head; and
first and second auxiliary posts connected to the primary post by a hinge mechanism;
wherein the first and second auxiliary posts are movable between a collapsed position wherein the first and second auxiliary posts are substantially adjacent to, and extend substantially parallel to, the primary post, and an expanded position wherein each of the first and second auxiliary posts extends away from the primary post at an angle to define a tripod shape.
17. The convertible support stand of claim 16, wherein the head includes a ball joint adapted to connect to the outdoor lighting product.

18. The convertible support stand of claim 16, further comprising a pivot located between the head and the primary post.

19. The convertible support stand of claim 16, wherein the primary post and the first and second auxiliary posts together define a tapered spike when in the collapsed position.

20. The convertible support stand of claim 16, wherein the hinge mechanism comprises:

10 a first hinge connected to the primary post and defining a first hinge axis;

a second hinge connecting the first and second auxiliary posts to the first hinge, the second hinge defining a second hinge axis that is substantially perpendicular to the first hinge axis.

15

21. The convertible support stand of claim 20, further comprising a spring associated with the second hinge, the spring adapted to bias the first and second auxiliary posts apart from one another.

20 22. The convertible support of claim 21, wherein the primary post defines a pocket adapted to receive a portion of the first and second auxiliary posts when in the collapsed position.

25

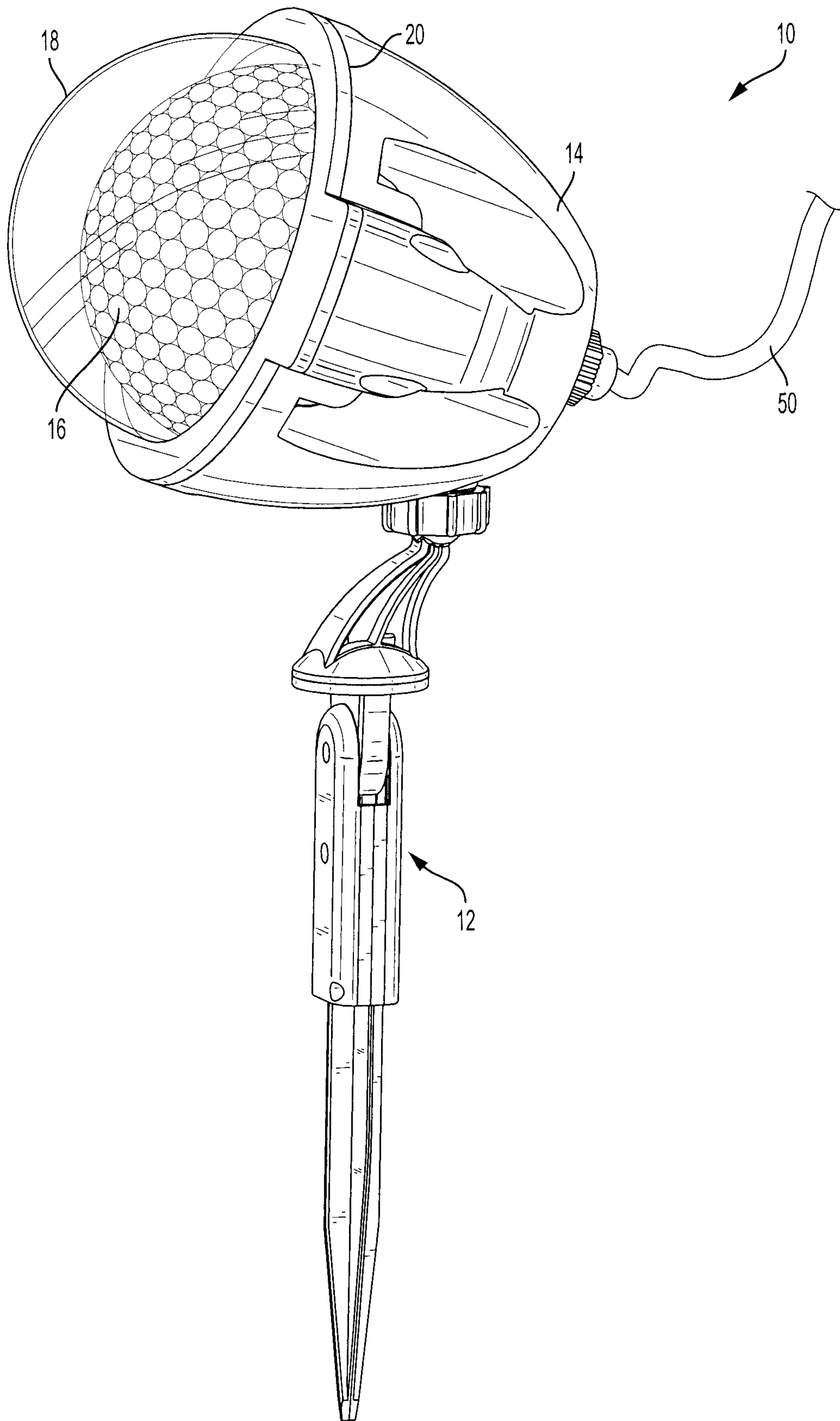


FIG. 1

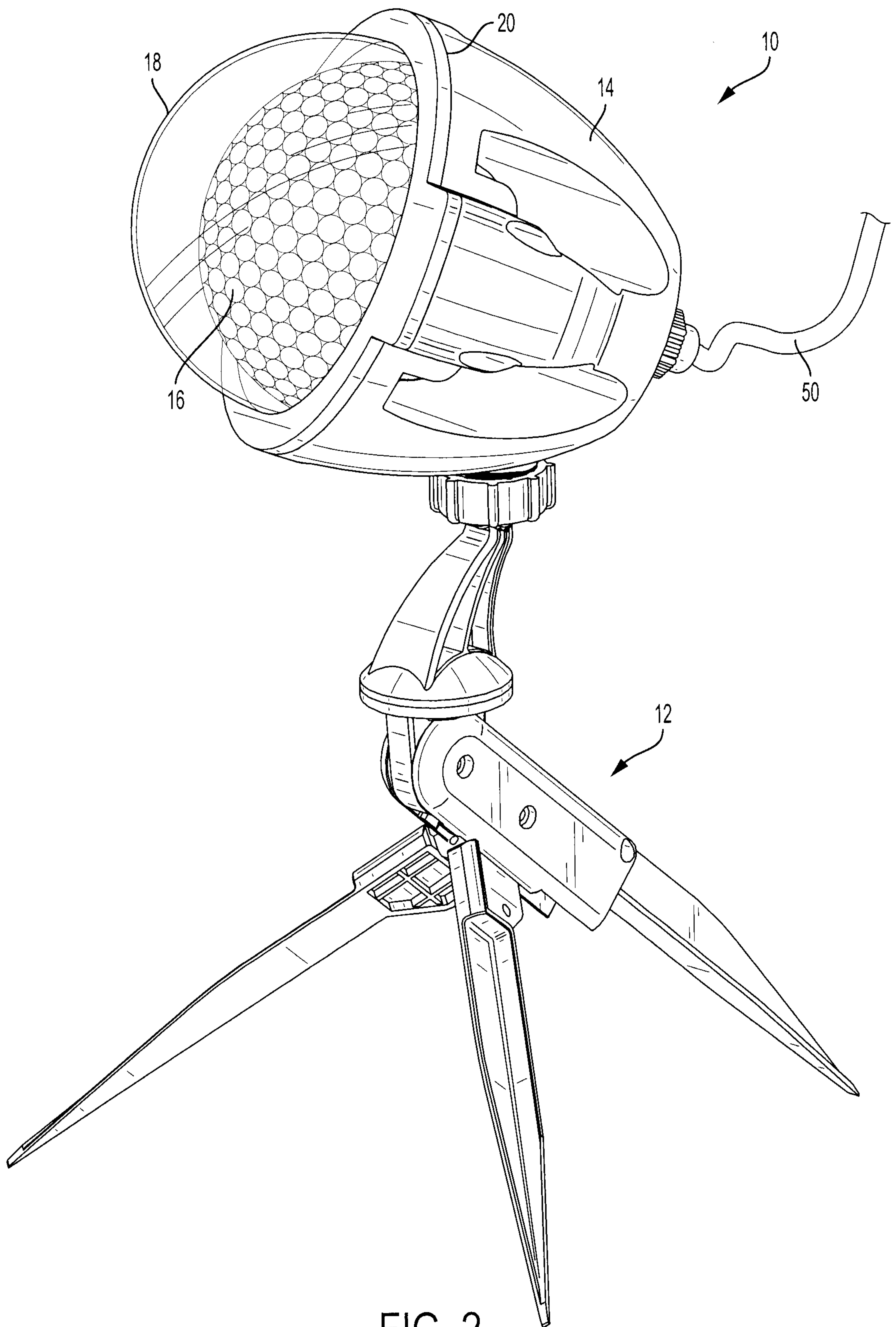


FIG. 2

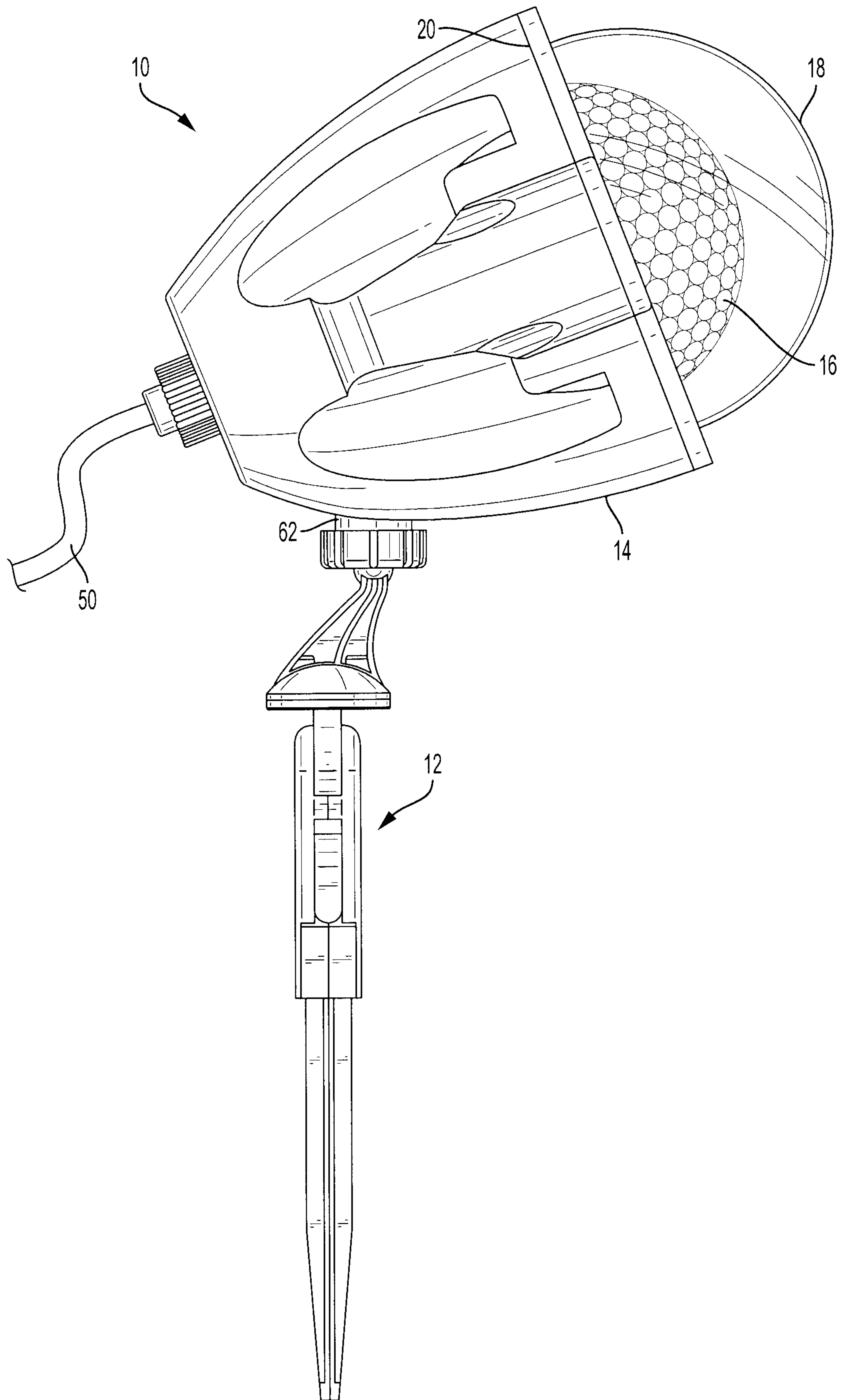


FIG. 3

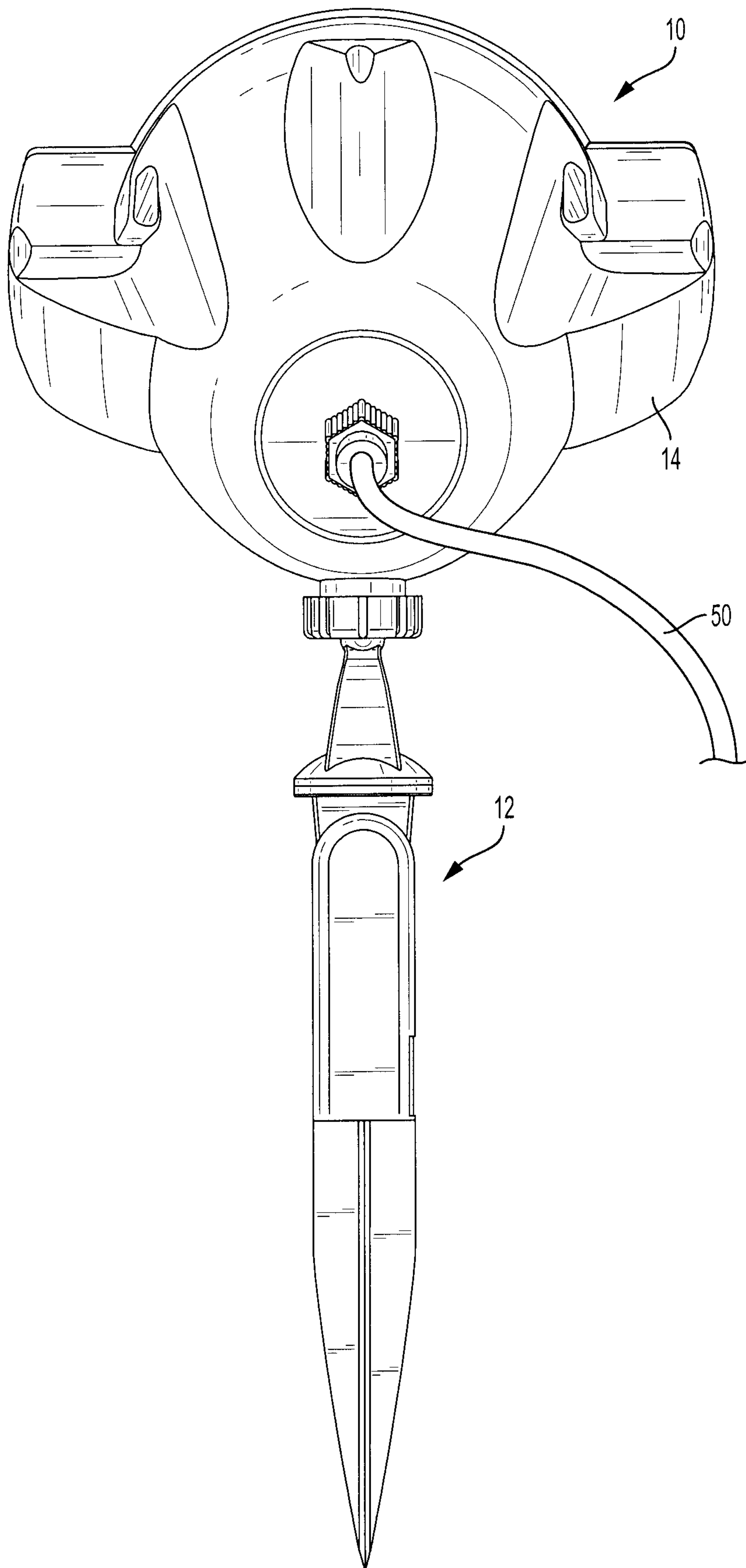


FIG. 4

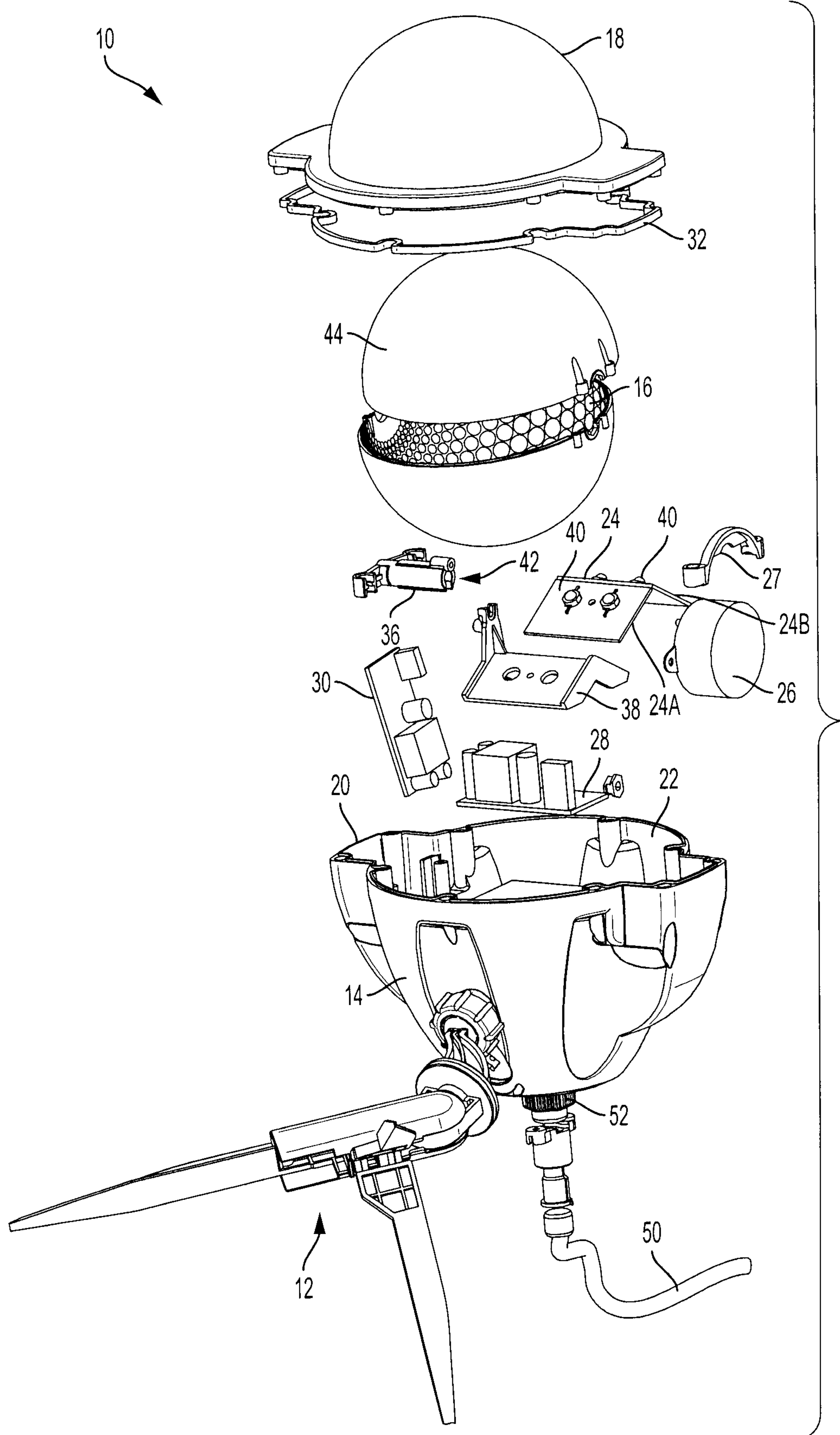


FIG. 5

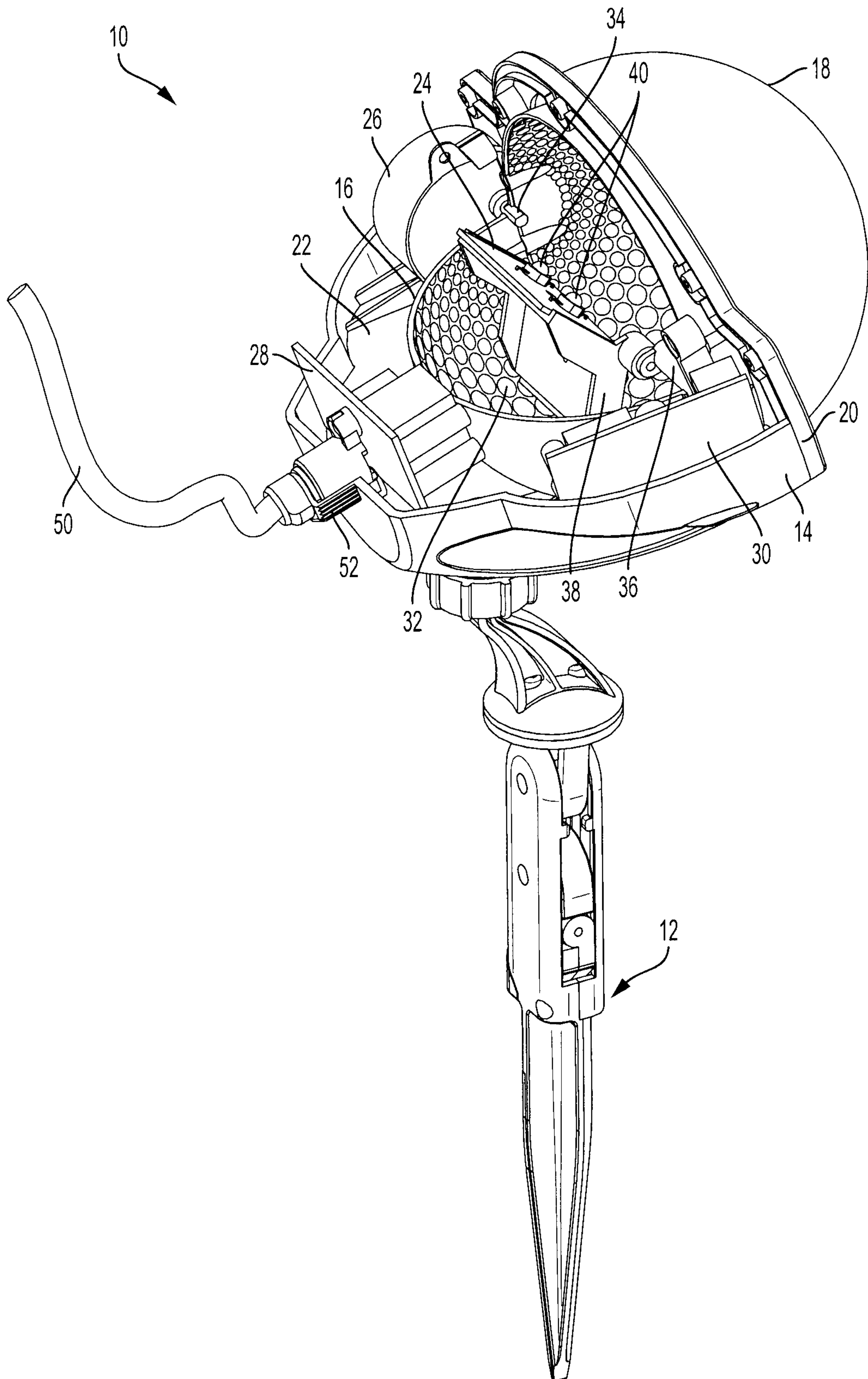


FIG. 6

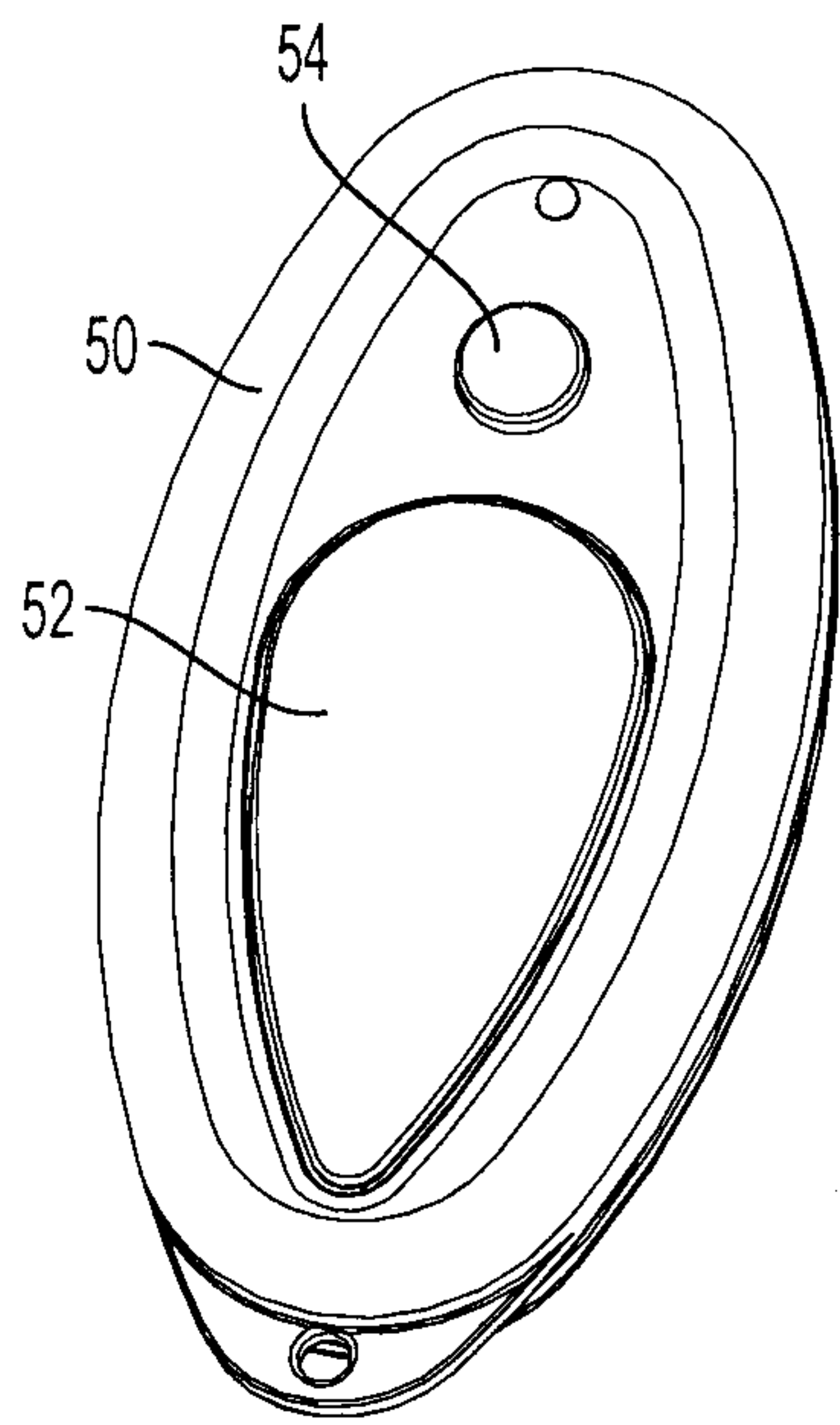


FIG. 7

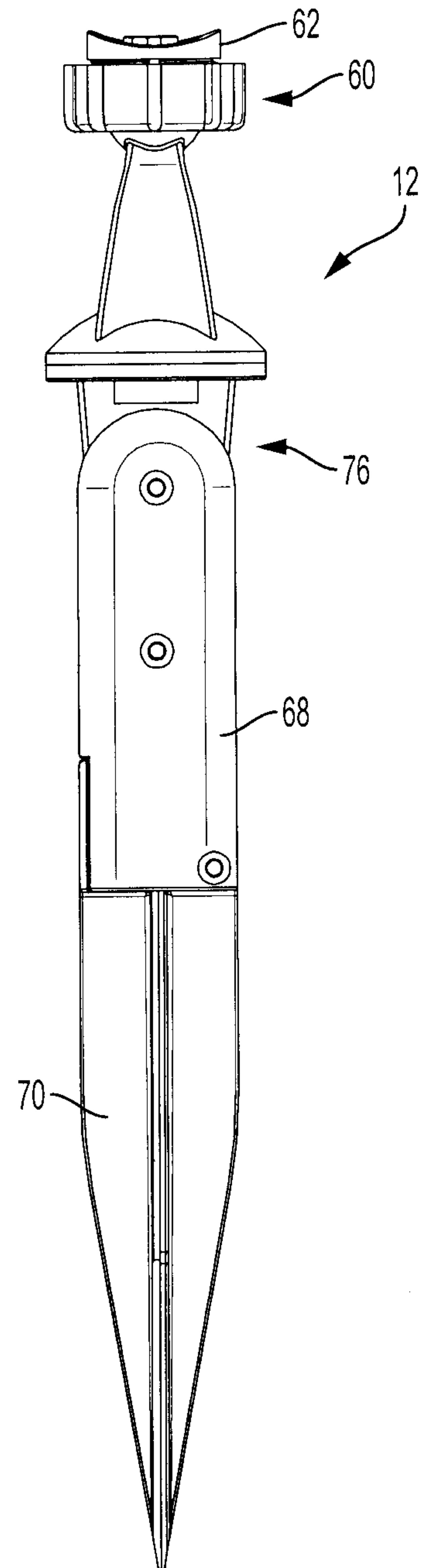


FIG. 8

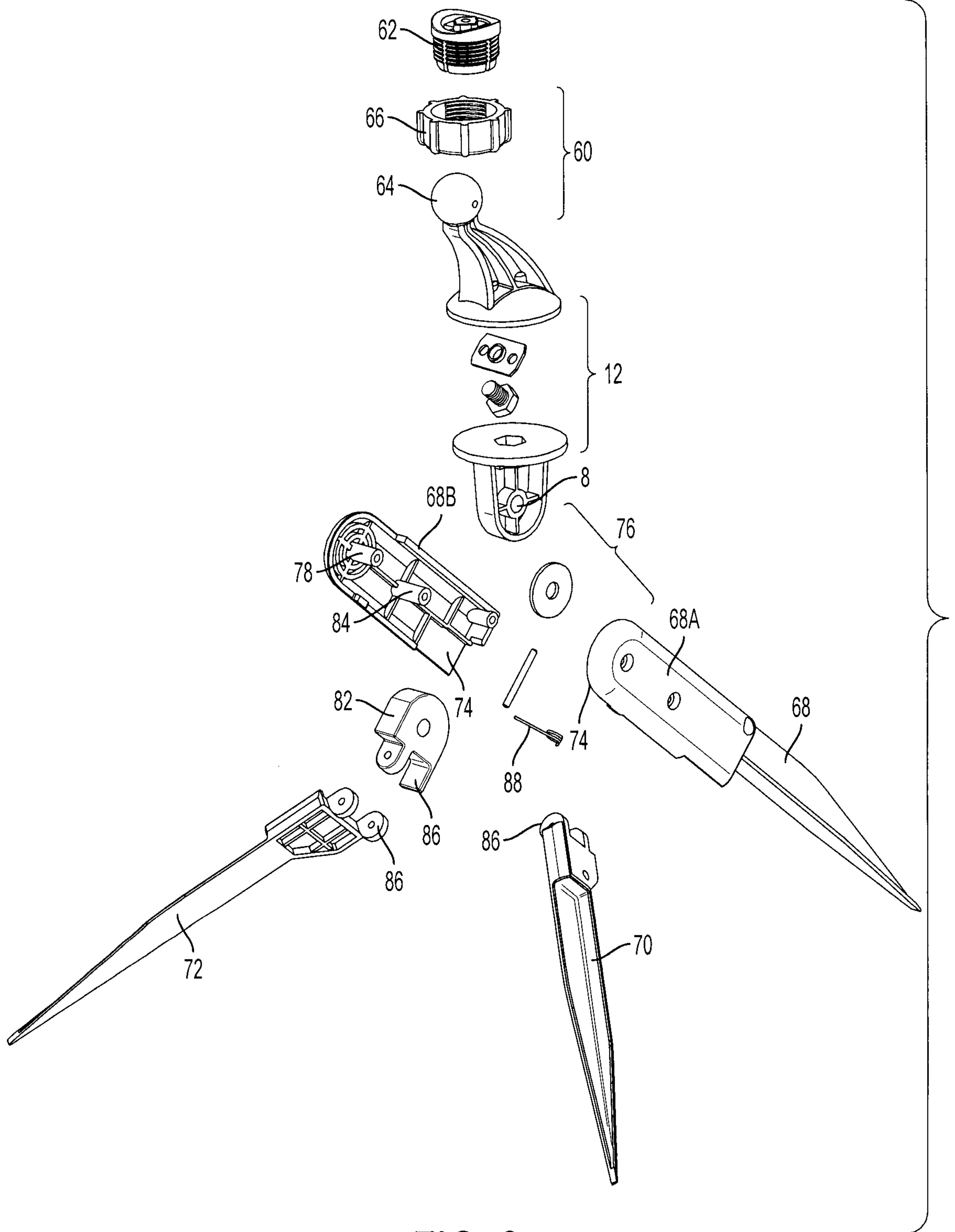


FIG. 9

