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**Fong**

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(54) **LIGHT DIFFUSER ADAPTER**

USPC ..... 362/16, 355  
See application file for complete search history.

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(57) **ABSTRACT**

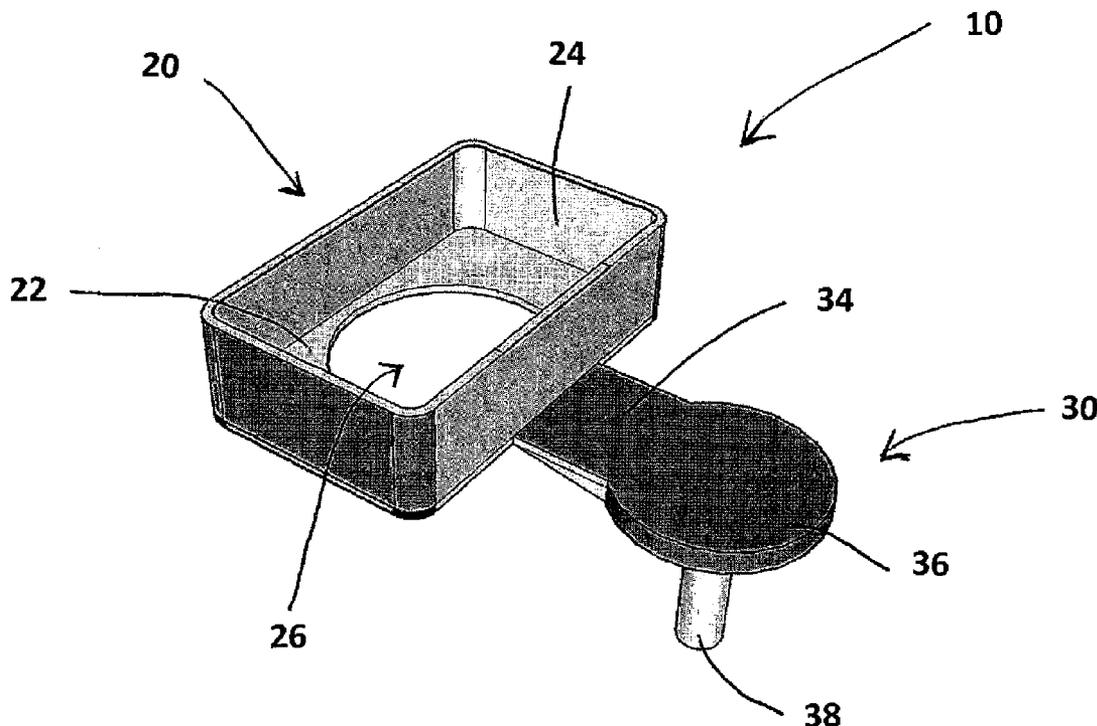
(51) **Int. Cl.**  
**G03B 15/02** (2006.01)  
**G03B 15/06** (2006.01)

An adapter configured to be coupled to a light diffuser, the adapter including a base comprising a bottom wall having an opening and a plurality of side walls extending from the bottom wall in a first direction, wherein the base is configured to accommodate a light diffuser; and a coupling portion extending from the base, the coupling portion having a protrusion extending therefrom in a second direction opposite to the first direction, the protrusion configured to couple the adapter to a light source assembly.

(52) **U.S. Cl.**  
CPC ..... **G03B 15/02** (2013.01); **G03B 15/06** (2013.01)

(58) **Field of Classification Search**  
CPC ..... G03B 15/12; G03B 15/06

**11 Claims, 7 Drawing Sheets**



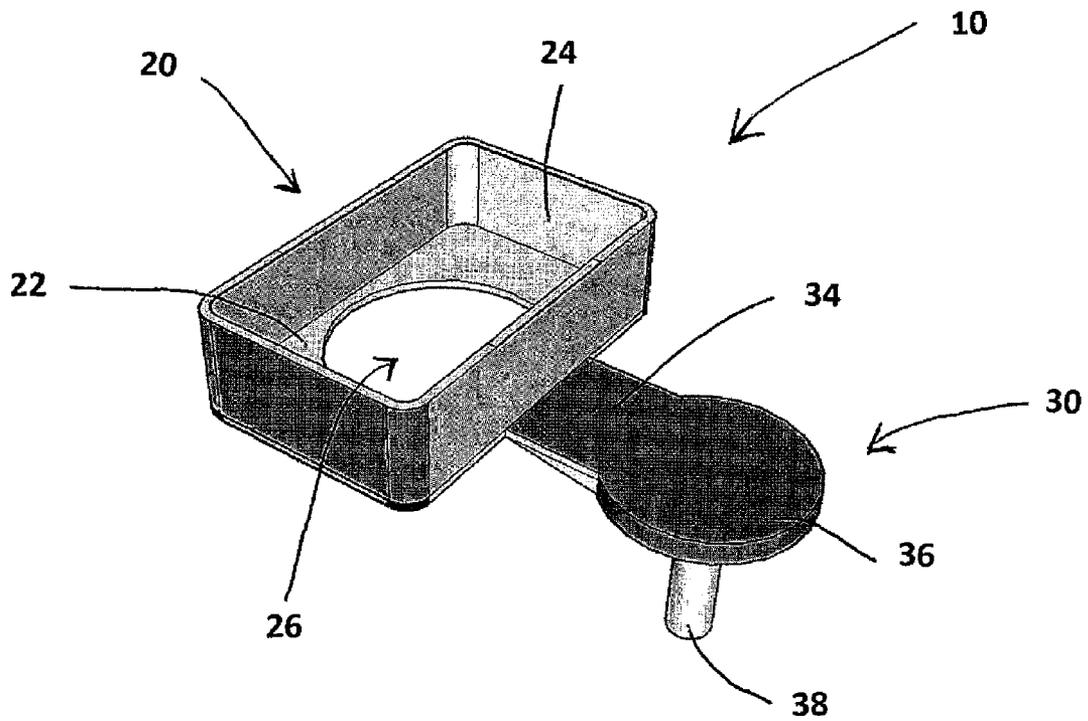


FIG. 1

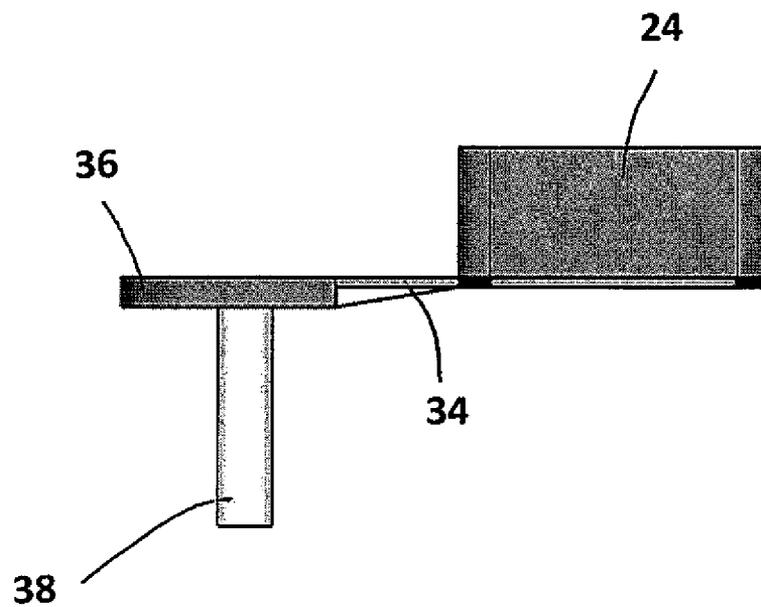


FIG. 2

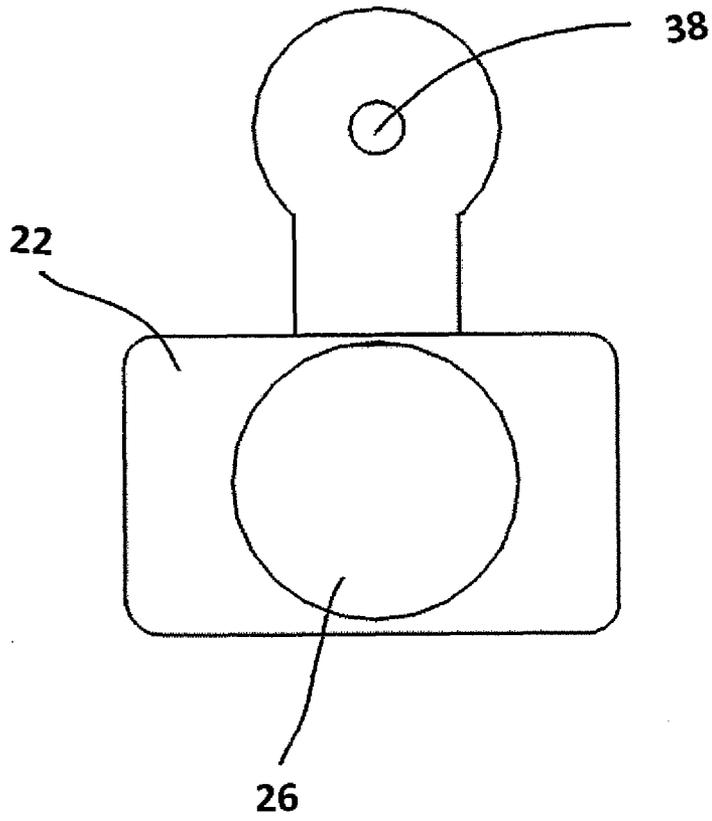


FIG. 3

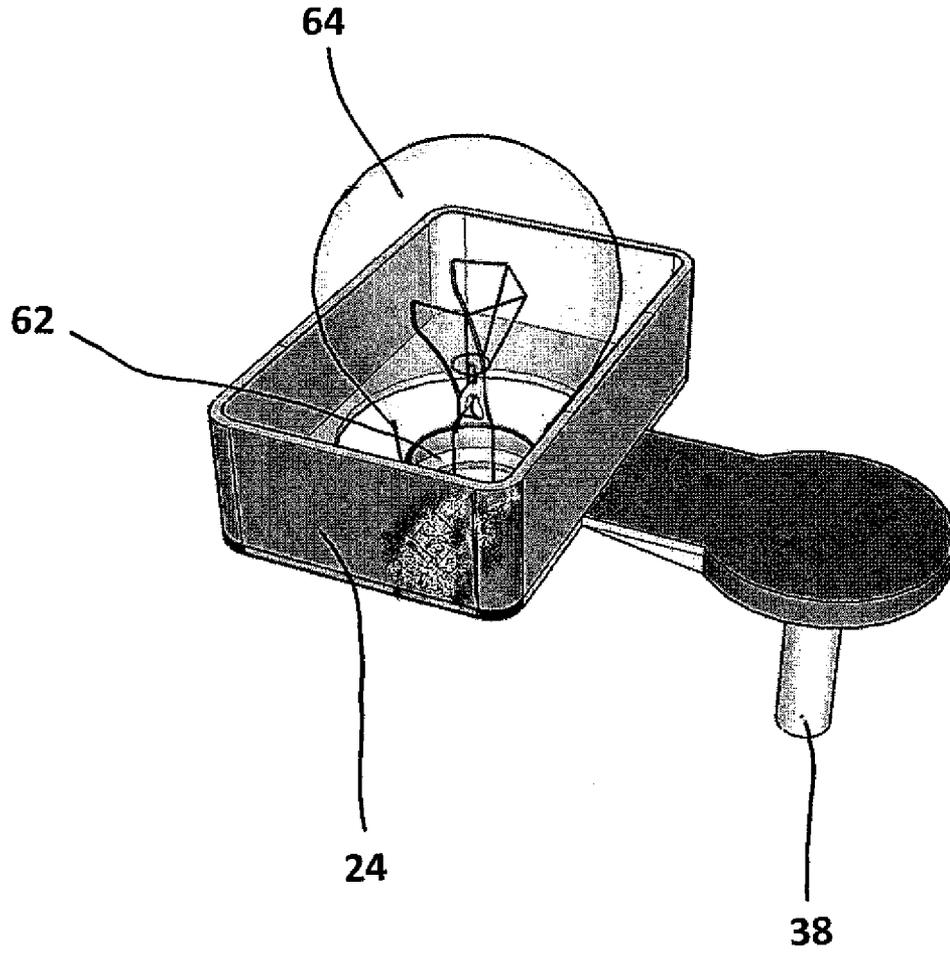


FIG. 4

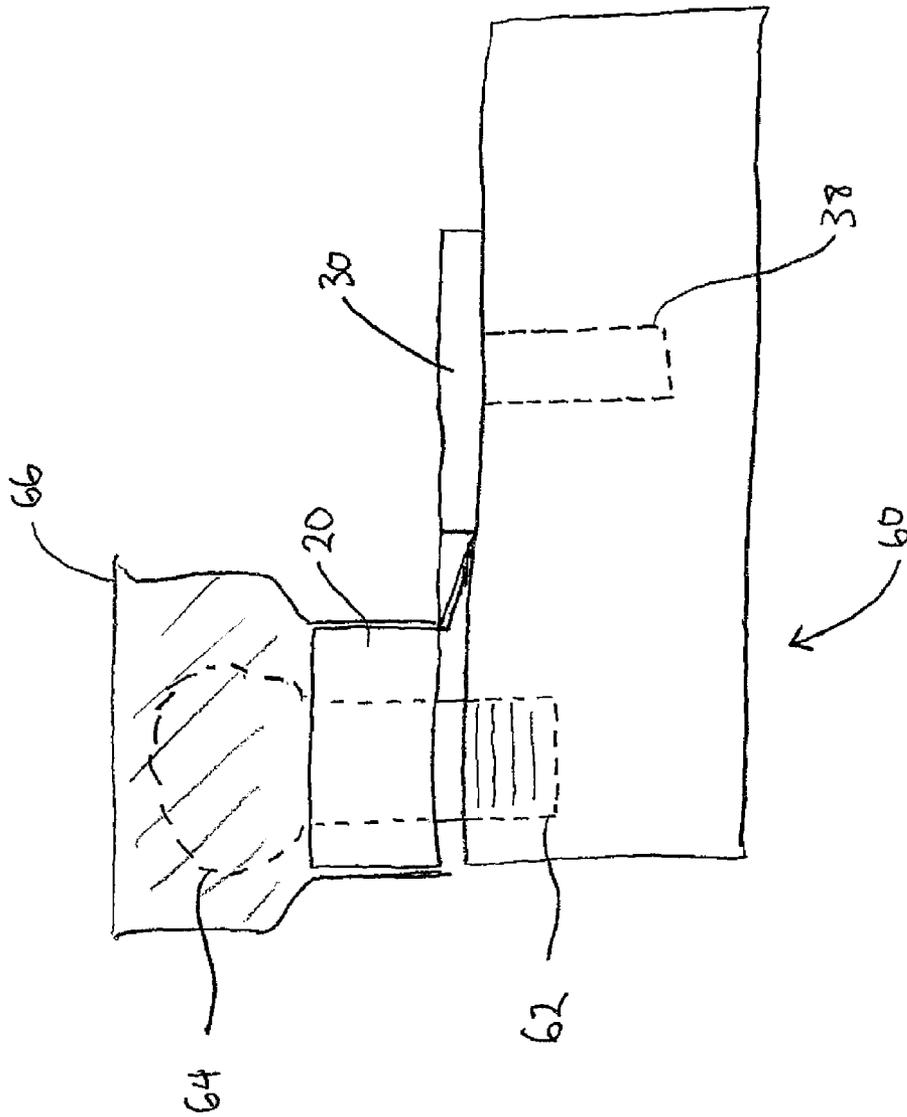


FIG. 5

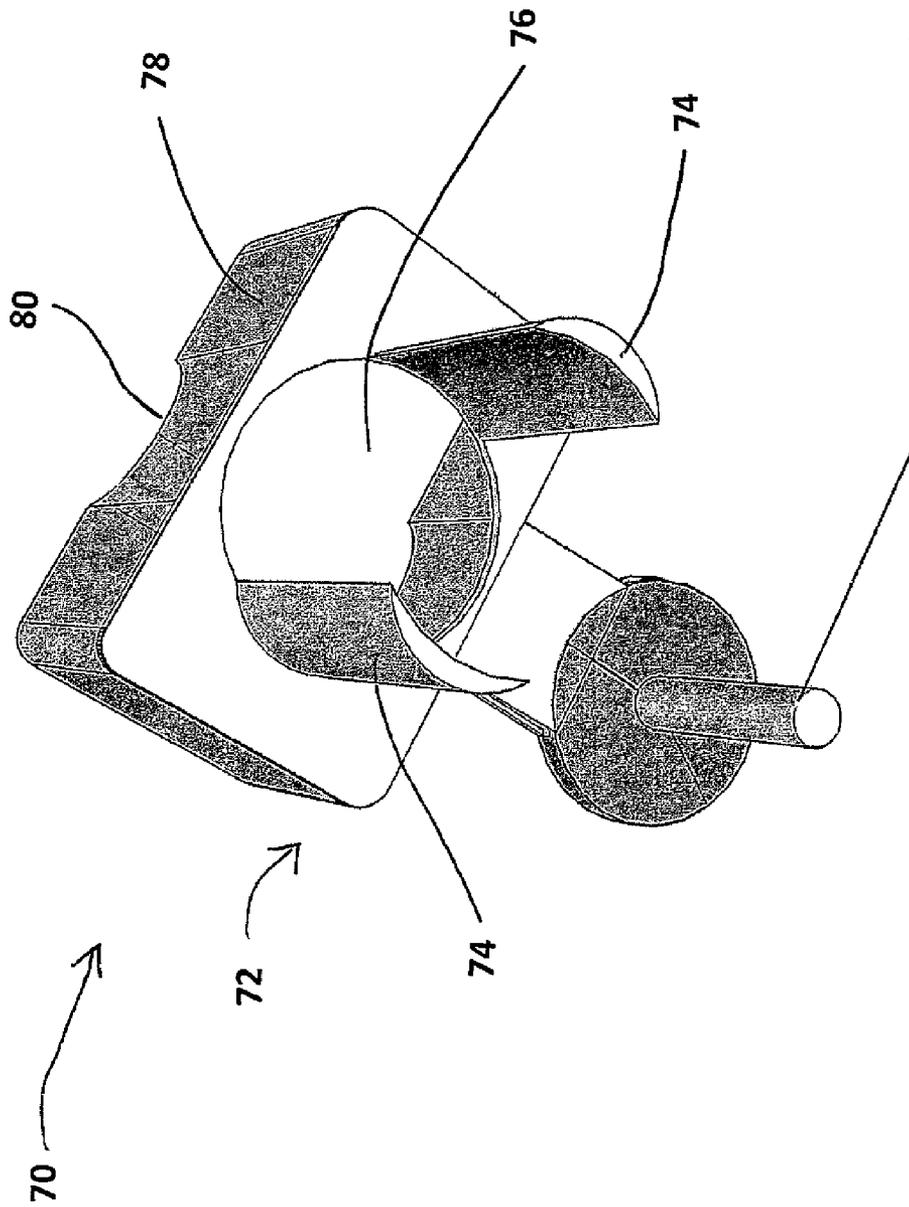


FIG. 6

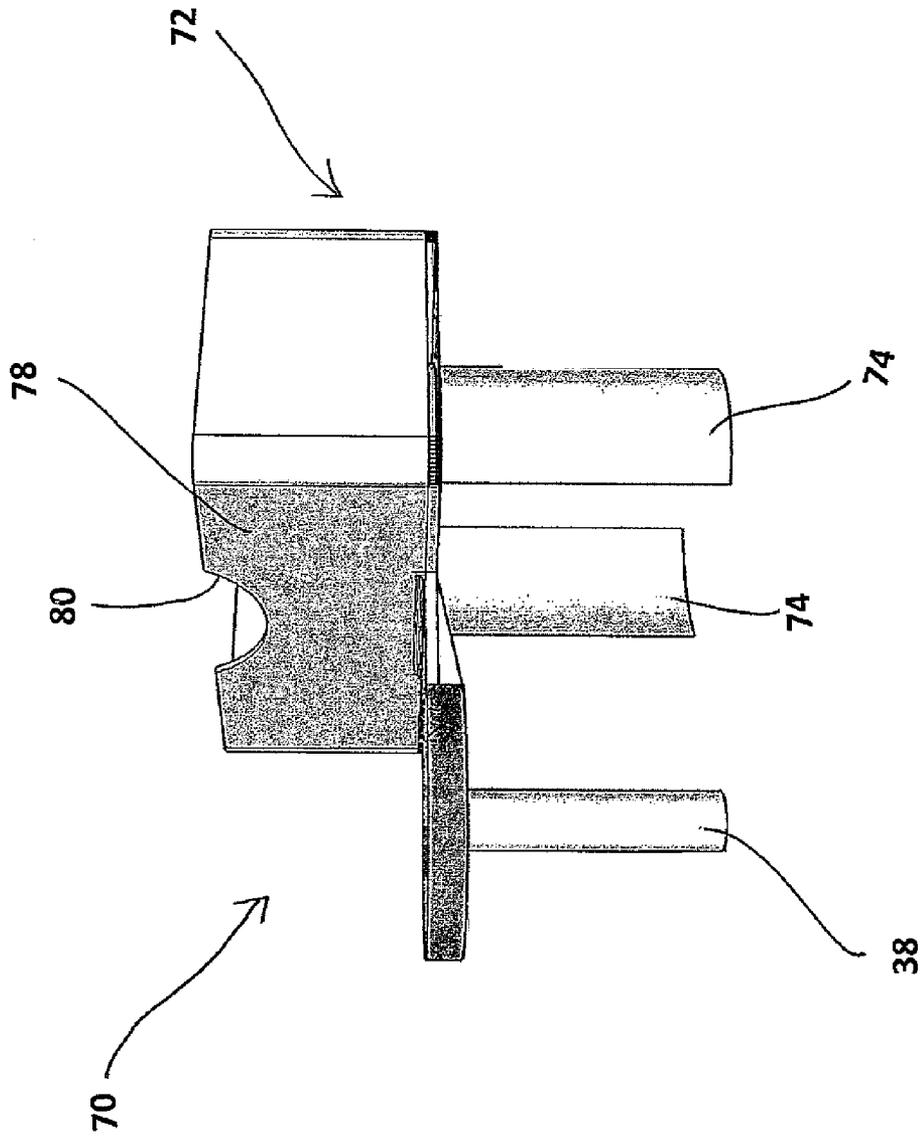


FIG. 7

1

**LIGHT DIFFUSER ADAPTER**

## FIELD OF THE INVENTION

Embodiments of the present invention are directed to an adapter for a light diffuser.

## BACKGROUND

Light diffusing accessories are used in photography and videography to provide light-altering effects, such as softened lighting or colored lighting in photographs or videos. Often, such light diffusion or alteration is provided by stationary screens, umbrellas, soft boxes, and the like. While such devices provide sufficient lighting effects in fixed studio settings where the burden of transporting the lighting equipment from place to place is minimal, such lighting equipment is often large and cumbersome and therefore not easy to transport from place to place for photographers who travel with their equipment.

To relieve the burden of packing and transporting large light-altering equipment to various sites, portable light diffusers which can be mounted directly to a camera flash are sometimes used. Portable light diffusers are significantly smaller than most large studio lighting equipment, yet can provide substantially the same effects. However, when a light source other than a standard camera flash is used, the light source assembly may not be configured to accommodate a portable light diffuser because such light sources are typically used with light diffusers that are not attached to the light source assembly. As such, there is a desire to be able to securely and effectively couple a light diffuser or other light-altering device to such a light source assembly.

## SUMMARY OF THE INVENTION

Embodiments of the present invention are directed to an adapter configured to accommodate a light diffuser and be coupled to light source assembly, particularly a light source assembly that is not typically directly coupled to a camera. Particularly, the adapter may be used to accommodate a light diffuser onto a studio light source assembly, wherein such studio light source assembly may use incandescent bulbs, LED bulbs, or other bulbs that can be easily replaced or switched out from the light source assembly.

In one embodiment, an adapter includes a base comprising a bottom wall having an opening and a plurality of side walls extending from the bottom wall in a first direction, wherein the base is configured to accommodate a light diffuser; and a coupling portion extending from the base, the coupling portion having a protrusion extending therefrom in a second direction opposite to the first direction, the protrusion configured to couple the adapter to a light source assembly.

In one embodiment, the base further comprises an arm extending in the second direction and configured to contact the light source assembly. The arm may have a concave surface configured to contact the light source assembly. Further, the arm may extend from a periphery of the opening of the base.

In one embodiment, the base is substantially rectangular and at least one of the side walls may have a notch thereon. Further, in one embodiment, the adapter is configured to be coupled to the light source assembly by an interference fit and the adapter is configured to be coupled to the light source assembly while a light source is in the light source assembly.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of an embodiment of an adapter of the present invention.

2

FIG. 2 is a side view of the adapter of FIG. 1.

FIG. 3 is a bottom view of the adapter of FIG. 1.

FIG. 4 is a perspective view of the adapter of FIG. 1 accommodating a light source.

FIG. 5 is a schematic cross-sectional view of the adapter of FIG. 1 accommodating a light source and coupled to a light source assembly.

FIG. 6 is a perspective view of a lower side of another embodiment of an adapter of the present invention.

FIG. 7 is a side perspective view of the adapter of FIG. 6.

## DETAILED DESCRIPTION OF THE INVENTION

In general, embodiments of the present invention provide an adapter configured to accommodate a light source therein and configured to be used in combination with a light diffuser, for example, a photographic or videographic light diffuser. The adapter allows a user to mount a diffuser onto a pre-existing light source assembly which typically includes a light source and a support structure for the light source. Particularly, the adapter may be used where the light source assembly is not a standard camera flash attached to a camera, but rather a light source assembly that is typically used for studio lighting, i.e., a light source that is separate from or spaced by a significant distance from the camera. The adapter allows the diffuser to be securely mounted onto the light source assembly without any additional tools or equipment and is sized to be easily portable and lightweight for convenience.

With reference now to FIGS. 1 to 5, the adapter 10 generally includes a base 20 configured to accommodate a light diffuser 66 and a coupling portion 30 configured to couple the adapter to a light source assembly 60 (FIG. 5).

In one embodiment, the adapter 10 is formed from plastics using an injection molding process. However, the adapter 10 may also be made from other molding and non-molding plastic forming processes, as well as from other relatively rigid materials, such as metal. Further, in one embodiment, the adapter 10 may be integral as a single piece, but in other embodiments, the adapter may be made in separate pieces that are coupled together.

In one embodiment, the adapter 10 is configured to accommodate a photographic light diffuser 66 such as the portable light diffuser described in U.S. Pat. No. 7,946,719, the subject matter of which is incorporated herein by reference. By being configured to be used with a portable light diffuser, the adapter allows heavier and more cumbersome equipment, such as large umbrellas, to be eliminated or minimized. Although the adapter 10 is configured to be used with the exemplary portable light diffuser 66 as described in more detail below, it will be apparent to those skilled in the art that the present invention is not limited to be used with the described light diffuser, but rather can be used with various different diffusers or other light-altering components.

The base 20 of the adapter 10 includes a bottom wall 22 and a plurality of side walls 24 extending from an edge of the bottom wall. In one embodiment, the base 20 is substantially rectangular in order to accommodate a light diffuser with a rectangular base. As shown in FIG. 1, the base 20 may have generally rounded corners to match rounded corners of the light diffuser base. However, it will be appreciated that a shape of the base 20 is not limited to being rectangular, but rather, can be provided in any appropriate shape to accommodate various diffusers depending on the shape of the diffuser base.

The base 20 is generally configured to have dimensions to accommodate a light diffuser base such that the diffuser can be supported and held thereon by an interference fit. Further,

the base **20** may be dimensioned such that the base does not substantially interfere with a light source **62** already located on a light source assembly **60**, as described in more detail below. Specifically, in one embodiment, the base **20** has a length from about 1.5 inches to about 5 inches, a width from about 1 inch to about 2.5 inches and a height of between about 0.5 inch and 2 inches, but it will be appreciated that the dimensions of the base **20** are not limited thereto.

In one embodiment, the bottom wall **22** has an opening **26** that is configured to be aligned with and expose a light source electrical socket **62** on the light source assembly **60**, as shown in FIGS. **4** and **5**, when the adapter **10** is coupled to the light source assembly **60**. Further, in one embodiment, the opening **26** is dimensioned to allow the adapter **10** to be inserted over a light source that is already electrically coupled to the socket **62** such that the light source does not have to be removed in order to accommodate the adapter. In one embodiment, the opening may have a diameter that is slightly less than a width of the base **20**. Specifically, the diameter may be between about 1 inch and 2.5 inches, but is not limited thereto.

The coupling portion **30** extends from a side edge of the base **20** and is configured to couple the adapter **10** to the light source assembly **60** and support the adapter when the adapter is coupled to the light source assembly. In one embodiment, the coupling portion **30** includes a coupling arm **32** extending from the base **20** and a protrusion **38** extending from the coupling arm and configured to engage the light source assembly **60**.

In one embodiment, the coupling arm **32** has a proximate portion **34** contacting the base and a distal portion **36** distal to the base **20** from the proximate portion. Further, in one embodiment, the proximate portion has a gradually increasing thickness in a direction away from the base **20** and towards the distal portion **36** to support the coupling portion **30**. Additionally, in one embodiment, the distal portion **36** is generally planar and has a substantially constant thickness.

The protrusion **38** extends from a surface of the distal portion in a direction opposite to a direction in which the base **20** extends from the coupling portion **36**. The protrusion **38** serves to couple the adapter **10** to the light source assembly **60**. Particularly, in one embodiment the protrusion **38** is a cylindrical rod configured to fit into an opening in the light source assembly **60** that typically accommodates a photographic umbrella base. The protrusion **38** can be coupled to the light source assembly **60** by an interference fit or by other coupling mechanisms as available or desired. In one embodiment, the protrusion **38** may have a diameter of between about 0.125 inches and about 1 inch and a length of between about 1 inch and 6 inches. However, as will be appreciated, the present invention is not limited to the specific dimensions listed herein.

With reference particularly to FIGS. **4** and **5**, in use, the protrusion **38** is inserted into an opening in the light source assembly **60** to couple the adapter **10** to the light source assembly. Simultaneously, the base **20** can be oriented such that the opening **26** in the base exposes an electrical socket **62** for a light source **64** of the light source assembly. The light source can be any light source that can be accommodated into the light source assembly, for example, a flash bulb, an LED bulb, an incandescent bulb, or any other suitable light source. As noted above, the opening **26** in the base **20** can be sized larger than the socket **62** such that the adapter **10** can slide over a light source already coupled to the socket. Once the adapter is coupled to the light source assembly **60** and oriented such that the light source **64** extends through the opening **26** in the base **20**, the diffuser **66** can be coupled by an interference fit to the base **20** of the adapter **10**. Of course, it

will be appreciated that the diffuser **66** could also be coupled to the base **20** before the adapter **10** is coupled to the light source assembly **60**.

With reference now to FIGS. **6** and **7**, another embodiment of an adapter **70** is shown. Because some of the aspects of the adapter **70** are similar to the embodiments of the adapter **10** shown in FIGS. **1-5**, only the main differences will be discussed in detail.

As shown in FIGS. **6** and **7**, a base **72** of the adapter **70** includes a pair of arms **74** extending from a portion of a periphery of an opening **76** of the base. The arms **74** are configured to extend around a portion of the light source assembly **60** to provide additional support to the base **72**, and particularly to prevent the base from moving or wobbling with respect to the light source assembly **60**. As shown, the arms **74** extend in the same direction as the protrusion **38** and have a concave surface which allows for greater surface area contact against a circular light source assembly **60**. As will be appreciated, however, the arms **74** can also be other configurations, such as planar, depending on the shape of the light source assembly. In one embodiment, a height of the arms **74** is substantially equal to a height of the protrusion **38**, but the height of the arms is not limited thereto. Additionally, in one embodiment, the arms **74** are integral as a single piece with the base **72**, but it will be appreciated that the arms could be made separately and attached to the base.

With continued reference to FIGS. **6** and **7**, at least one side wall **78** of the base **72** has a notch **80** thereon to provide additional support and resistance against bending or deformation. In one embodiment, the notch **80** is located on an upper edge of the side wall **78** and is semi-circular, but the location and shape of the notch are not limited thereto. Additionally, each side wall **78** of the base **72** could include the notch **80**.

Although the adapter according to exemplary embodiments of the present invention has been described in detail hereinabove, it should be understood that many variations and modifications of the basic inventive concept herein described, which may appear to those skilled in the art, will still fall within the spirit and scope of the exemplary embodiments of the present invention as defined by the appended claims.

What is claimed is:

1. An adapter configured to be coupled to a light diffuser, the adapter comprising:
  - a base comprising a bottom wall having an opening and a plurality of side walls extending from the bottom wall in a first direction, wherein the base is configured to accommodate a light diffuser; and
  - a coupling portion extending from the base, the coupling portion having a protrusion extending therefrom in a second direction opposite to the first direction, the protrusion configured to couple the adapter to a light source assembly.
2. The adapter of claim 1, wherein the base further comprises an arm extending in the second direction and configured to contact the light source assembly.
3. The adapter of claim 2, wherein the arm has a concave surface configured to contact the light source assembly.
4. The adapter of claim 2, wherein the arm extends from a periphery of the opening of the base.
5. The adapter of claim 2, wherein the arm comprises a plurality of arms.
6. The adapter of claim 1, wherein the base is substantially rectangular.
7. The adapter of claim 1, wherein at least one of the side walls has a notch thereon.

8. The adapter of claim 1, wherein the adapter is configured to be coupled to the light source assembly by an interference fit.

9. The adapter of claim 1, wherein the adapter is configured to be coupled to the light source assembly while a light source is in the light source assembly. 5

10. The adapter of claim 1, wherein the light source assembly is not configured to be directly coupled to a camera.

11. The adapter of claim 1, wherein a light source of the light source assembly is an incandescent bulb. 10

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