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Kuo

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(54) **MOBILE TELEPHONE**

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(51) **Int. Cl.**

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F21V 7/07	(2006.01)
H04N 5/225	(2006.01)
H04M 1/02	(2006.01)

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CPC ***H04N 5/2256*** (2013.01); ***H04M 1/0254*** (2013.01); *H04M 1/0264* (2013.01)

(58) **Field of Classification Search**
USPC 455/575.1, 90.1, 90.3; 362/296.01, 277, 362/97.3, 304, 296.07, 296.1; 348/207.99
See application file for complete search history.

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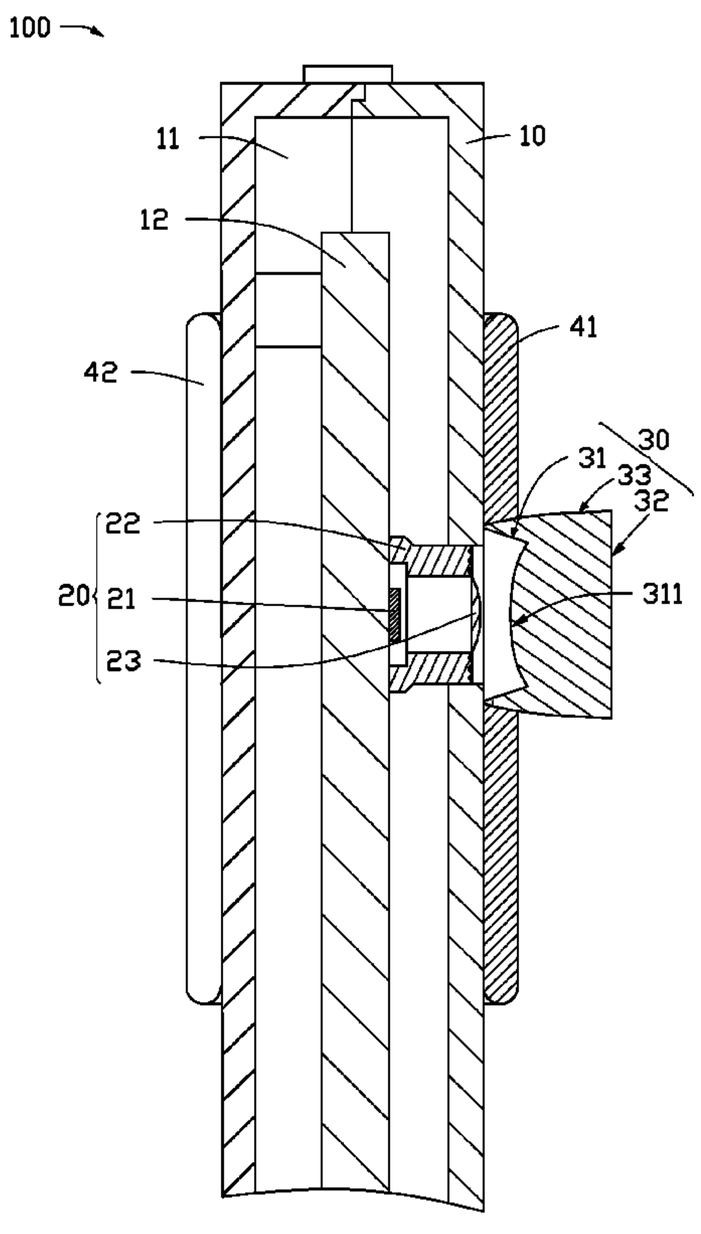
(57) **ABSTRACT**

The present disclose relates to a mobile telephone, including a main body, a light source and an optical element. The main body defines a cavity. The light source is received in the cavity. The optical element is removably mounted on the main body and located at a pathway of the light source. Light emitted from the light source is converged by the optical element to outside.

10 Claims, 3 Drawing Sheets



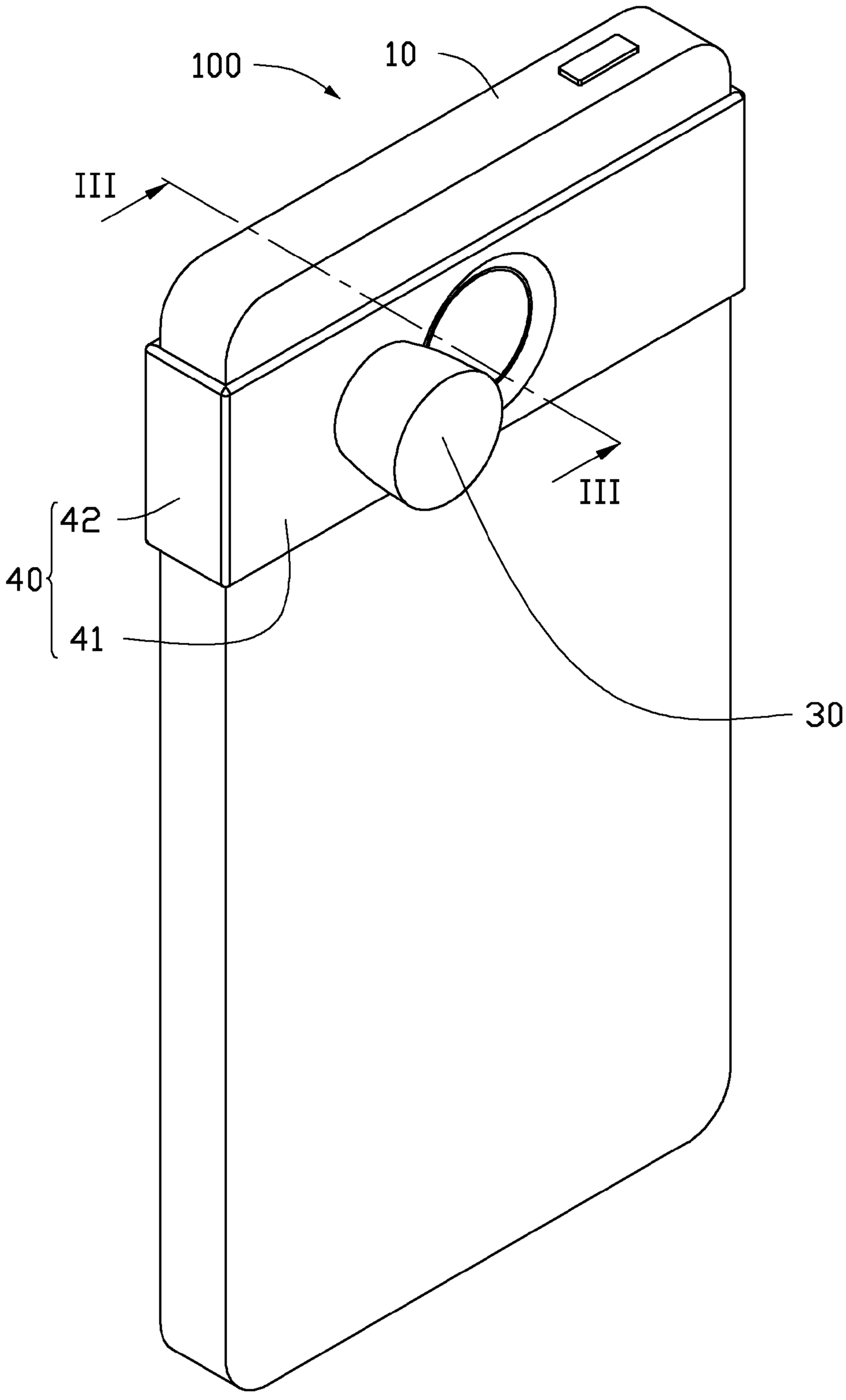


FIG. 1

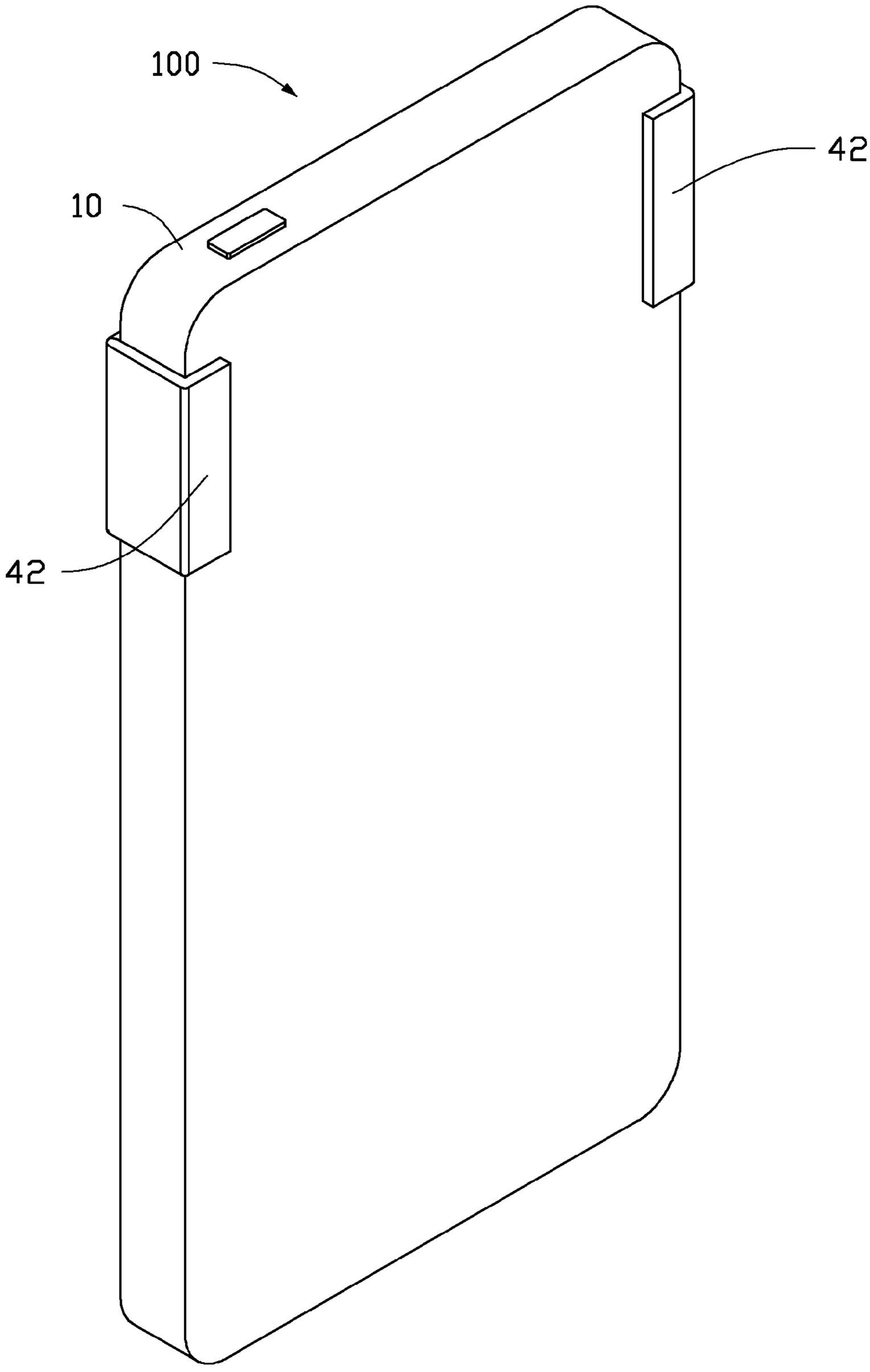


FIG. 2

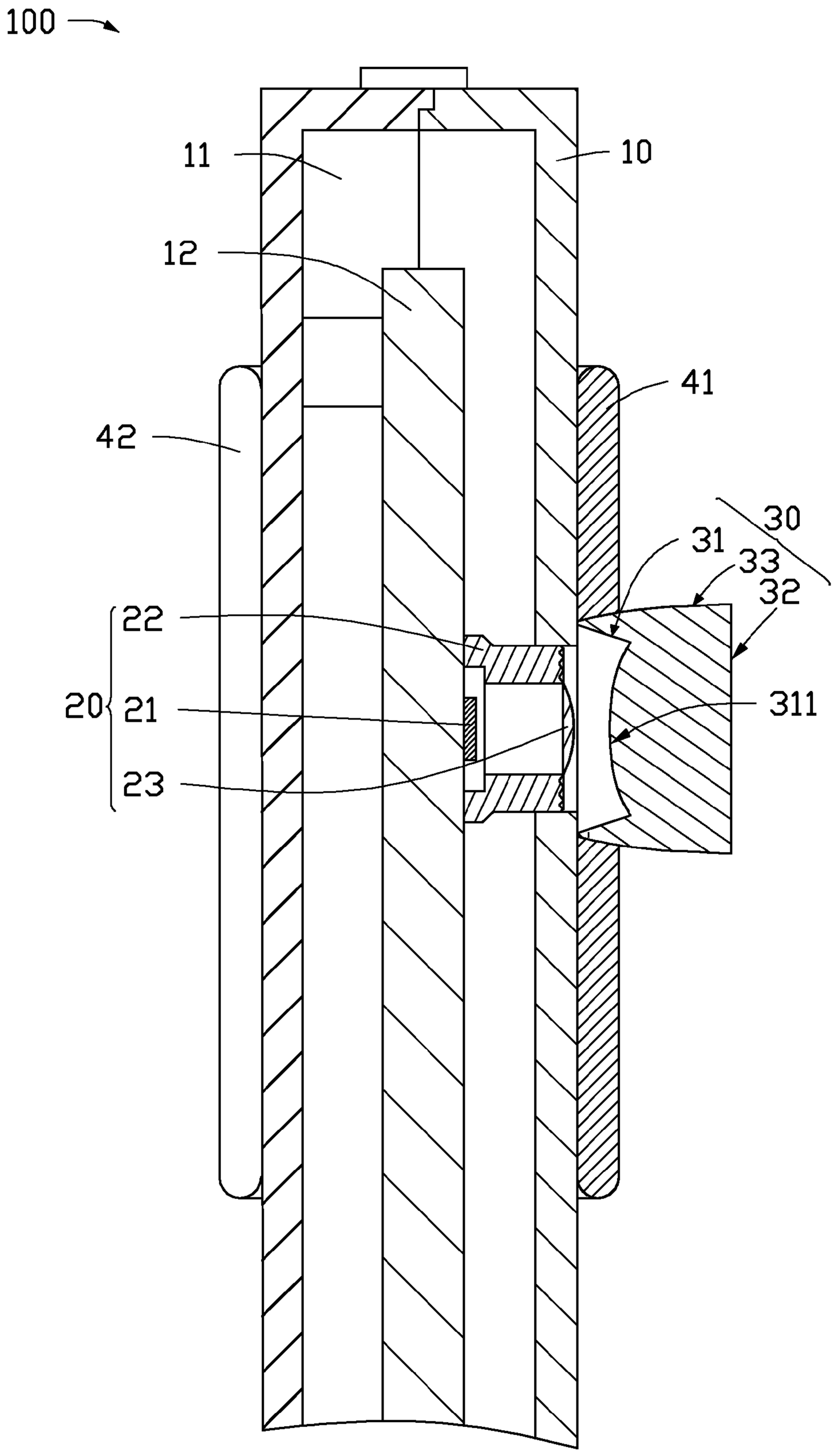


FIG. 3

MOBILE TELEPHONE

BACKGROUND

1. Technical Field

The disclosure relates to electronic device, and particularly to a mobile telephone.

2. Description of Related Art

Generally, a mobile telephone includes a photoflash lamp for supplementing light when taking photography. A lens, such as a Fresnel lens is located at the light pathway of the photoflash lamp for diverging light. However, the light diverged angle of the photoflash lamp of the mobile telephone is too large to use as a flashlight.

Therefore, what is needed is a mobile telephone which can overcome the described limitations.

BRIEF DESCRIPTION OF THE DRAWINGS

Many aspects of the disclosure can be better understood with reference to the following drawing. The components in the drawing are not necessarily drawn to scale, the emphasis instead being placed upon clearly illustrating the principles of the present mobile telephone. Moreover, in the drawing, like reference numerals designate corresponding parts throughout the whole view.

FIG. **1** is a schematic, isometric view of a mobile telephone according to an exemplary embodiment.

FIG. **2** is another schematic, isometric view of the mobile telephone of FIG. **1**.

FIG. **3** is a cross-sectional view of the mobile telephone of FIG. **1**, taken along line III-III thereof.

DETAILED DESCRIPTION OF EMBODIMENTS

Referring to the FIGS. **1-3**, a mobile telephone **100** in accordance with an exemplary embodiment of the present disclosure is shown. The mobile telephone **100** includes a main body **10**, a light source **20**, an optical element **30** and a fixing element **40**.

In the present embodiment, the main body **10** defines a cavity **11** for receiving a circuit body **12**. The light source **20** is received in the cavity **11** and arranged on the circuit body **12**. The light source **20** includes light emitting element **21**, a supporting element **22** surrounding the light emitting element **21** and a lens **23** arranged on the supporting element **22** and located at the light pathway of the light emitting element **21**. In the present embodiment, the light emitting element **21** is an LED (light emitting diode) and arranged on the circuit body **12**. The lens **23** is a convex lens. A top portion of the supporting element **22** includes a plurality of annular protrusions. The lens **23** and the annular protrusions cooperatively form a Fresnel lens for diverging light emitted from the light emitting element **21**.

The optical element **30** includes a light input surface **31**, a light output surface **32** opposite to the light input surface **31**, and a side surface **33** positioned between and connected to the light input surface **31** and the light output surface **32**. The light input surface **31** includes a convex surface **311** facing the lens **23** and protruding towards the light emitting element **21**. The light output surface **32** is a planar surface, and the side surface **33** is a frusto-conical surface. The side surface **33** is a total reflective face. In the present embodiment, a central axis of the light emitting element **21** is coaxial to that of the optical element **30**. Light beams emitted from the light source **20** pass through the light input surface **31** and enter the optical element **30**. A part of light beams travels through the optical element **30** to an outside through the light output surface **32** directly, and the other part of light beams is reflected by the side surface **33** and then travels through the light output surface **32** of the optical element **30** to the outside. All light beams travelling through the optical element **30** are collimated and converged by the optical element **30**. In the present embodiment, the optical element **30** is a collimating lens, and light beams travelling through the optical element **30** are collimated to parallel light beams.

The optical element **30** is extractably mounted on an outside of the main body **10** via the fixing element **40**. In the present embodiment, the fixing element **40** includes a fixing part **41** and two clip parts **42** located at two ends of the fixing part **41**. The optical element **30** is fixed on the fixing part **41**, and the two clip parts **42** are respectively clasped with two edges of the main body **10**. In the present embodiment, the fixing part **41** and the two clip parts **42** are integrally formed with one piece. The two clip parts **42** have elasticity; therefore, the fixing element **40** is fixed on the main body **10** steady by the elastic force generated therefrom.

When the light source **20** of the mobile telephone **100** is at a first state, functioning as flashlight. The optical element **30** is fixed on the main body **10** via the fixing element **40**. Light emitted from the light source **20** is collimated and converged by the optical element **30**; therefore, it can improve the brightness and the irradiate distance. When the light source **20** of the mobile telephone **100** is at a second state, functioning as photoflash, the optical element **30** is removed.

It is to be further understood that even though numerous characteristics and advantages have been set forth in the foregoing description of embodiments, together with details of the structures and functions of the embodiments, the disclosure is illustrative only; and that changes may be made in detail, especially in matters of shape, size, and arrangement of parts within the principles of the disclosure to the full extent indicated by the broad general meaning of the terms in which the appended claims are expressed.

What is claimed is:

1. A mobile telephone, comprising:

a main body defining a cavity;

a fixing element removably mounted on the main body, the fixing element defining a hole;

a light source received in the cavity; and

an optical element directly connected to the fixing element by being inserted into the hole of the fixing element on the main body and located at a pathway of the light source, whereby light emitted from the light source being converged by the optical element.

2. The mobile telephone of claim **1**, wherein the optical element is a collimating lens.

3. The mobile telephone of claim **1**, wherein the optical element comprises a light input surface, a light output surface opposite to the light input surface, and a side surface positioned between and connected to the light input surface and the light output surface, the light input surface comprising a convex surface facing the light source and protruding towards the light source, the light output surface being a planar surface, and the side surface being a total reflective face.

4. The mobile telephone of claim **1**, wherein a central axis of the light source is coaxial to that of the optical element.

5. The mobile telephone of claim **1**, wherein the fixing element comprises a fixing part and two clip parts located at two ends of the fixing part, and the two clip parts being respectively clasped with two edges of the main body.

6. The mobile telephone of claim **5**, wherein the fixing part and the two clip parts are integrally formed with one piece.

7. The mobile telephone of claim 5, wherein the two clip parts are elastic.

8. A mobile telephone, comprising:

a main body defining a cavity;

a light source received in the cavity;

a fixing element removably mounted on the main body, the fixing element defining a hole; and

a collimating lens directly connected to the fixing element by being inserted into the hole of the fixing element and located at a pathway of the light source via the fixing element, whereby light emitted from the light source being converged by the collimating lens.

9. The mobile telephone of claim 8, wherein the collimating lens comprises a light input surface, a light output surface opposite to the light input surface, and a side surface positioned between and connected to the light input surface and the light output surface, the light input surface comprising a convex surface facing the light source and protruding towards the light source, the light output surface being a planar surface, and the side surface being a total reflective face.

10. The mobile telephone of claim 8, wherein the fixing element comprises a fixing part and two clip parts located at two ends of the fixing part, and the two clip parts being respectively clasped with two edges of the main body.

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