WHAT IS CLAIMED IS:

1. Ring light illuminator, comprises:

- a plurality of annularly arranged light sources,
- a beam shaper is assigned to each light source;
- a light collector for collecting light from each light source;
- a homogenizing means following the light collector for light from each light source; and
- an imaging means for imaging an output of the homogenizing means into an area to be illuminated.

2. Ring light illuminator according to claim 1, wherein the homogenizing means is a rod.

3. Ring light illuminator according to claim 2, wherein the rod and the light collector together form a one-piece unit.

4. Ring light illuminator according to claim 2, wherein the rod, the light collector and the imaging means together form a one-piece unit.

5. Ring light illuminator according to claim 2, wherein the homogenizing function of the rod is based on total internal reflection of light within the rod.

6. Ring light illuminator according to claim 1, wherein the imaging means is an imaging lens.

7. Ring light illuminator according to claim 6, wherein the imaging lens has an aspheric exit surface.

8. Ring light illuminator according to claim 1, wherein the homogenizing means is a texture provided on the light collector.

9. Ring light illuminator of claim 1, wherein each light source comprises at least one light emitting diode (LED).

10. Ring light illuminator of claim 1, wherein the ring light illuminator exhibits plural cooling fins.

11. Beam shaper, comprising:

- a light collector for collecting light from a light source;
- a homogenizing rod for homogenizing the light from the light source; and
- a lens for imaging an end of the homogenizing rod opposite the light collector into an area to be illuminated, wherein the light collector, the homogenizing rod and the lens for imaging are manufactured as one piece

12. Beam shaper of claim 11, wherein the beam shaper is molded from a plastic material.

13. Beam shaper of claim 11, wherein the beam shaper is made of glass.

14. Beam shaper of claim 11, wherein the lens for imaging has an aspheric exit surface for imaging the homogenizing rod onto an area to be illuminated.

CLAIMS

1. A ring light illuminator comprising:
a plurality of annularly arranged light sources;
a plurality of beam shapers, each beam shaper assigned to a light source of the plurality of annularly arranged light sources, wherein each beam shaper includes:
a light collector for collecting light from the assigned light source, wherein the light collector includes a receiving cavity and a refractive lens portion, wherein the cavity of the light collector is arranged to encompass the assigned light source, wherein the light collector has a polygonal cross-section;
a homogenizer optically coupled to an output of the light collector and configured to homogenize light from the assigned light source; and
an imaging lens for imaging an output of the homogenizer into an area to be illuminated, wherein the homogenizer has a polygonal cross-section matched to the polygonal cross-section of the light collector.

2. The ring light illuminator according to claim **1**, wherein the homogenizer is a rod.

3. The ring light illuminator according to claim **2**, wherein the rod and the light collector together form a one-piece unit.

4. The ring light illuminator according to claim **2**, wherein the rod, the light collector and the imaging lens together form a one-piece unit.

5. The ring light illuminator according to claim **2**, wherein a homogenizing function of the rod is based on total internal reflection of light within the rod.

6. The ring light illuminator according to claim **1**, wherein the imaging lens has an aspheric exit surface.

7. The ring light illuminator of claim **1**, wherein each light source comprises at least one light emitting diode (LED).

8. The ring light illuminator of claim **1**, wherein the ring light illuminator includes a plurality of cooling fins.

9. A beam shaper comprising:

a light collector for collecting light from a light source, wherein the light collector includes a receiving cavity and a refractive lens portion, wherein the cavity of the light collector is arranged to encompass the light source, wherein the light collector has a hexagonal cross-section;

a homogenizing rod for homogenizing the light from the light source; and

a lens for imaging an end of the homogenizing rod opposite the light collector into an area to be illuminated, wherein the light collector, the homogenizing rod and the lens for imaging manufactured as one piece, wherein the homogenizer has a hexagonal cross-section matched to the hexagonal cross-section of the light collector.

10. The beam shaper of claim **9**, wherein the beam shaper is molded from a plastic material.

11. The beam shaper of claim **9**, wherein the beam shaper is made of glass.

12. The beam shaper of claim **9**, wherein the lens for imaging has an aspheric exit surface for imaging the homogenizing rod onto an area to be illuminated.