What is claimed is:

1. A local exposure method of locally performing exposure processing by dividing a photosensitive film formed on a substrate to be treated into a plurality of large blocks, relatively moving the substrate below a plurality of light emitting elements arranged in a line shape and in a direction intersecting with an arrangement direction of the light emitting elements, and selectively controlling light emission of the plurality of light emitting elements based on an illuminance set in advance for each of the large blocks, said local exposure method comprising the steps of:

dividing the large block into a plurality of small blocks;

setting irradiation illuminances different in a stepwise fashion for the small blocks in the large block respectively;

controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate relatively moving with respect to the plurality of light emitting elements;

developing the photosensitive film which has been subjected to exposure processing by irradiation by the light emitting elements;

measuring a residual film thickness of the photosensitive film for each of the small blocks which have been subjected to the development to obtain correlation data between the illuminance set for the small block and the residual film thickness; and

obtaining a required illuminance of irradiation to each of the large blocks from a target residual film thickness of the photosensitive film set for each of the large blocks based on the correlation data.

2. A local exposure method of locally performing exposure processing

by dividing a photosensitive film formed on a substrate to be treated into a plurality of large blocks, relatively moving the substrate below a plurality of light emitting elements arranged in a line shape and in a direction intersecting with an arrangement direction of the light emitting elements, and selectively controlling light emission of the plurality of light emitting elements based on an illuminance set in advance for each of the large blocks, said local exposure method comprising the steps of:

dividing the large block into a plurality of small blocks;

setting irradiation illuminances different in a stepwise fashion for the small blocks in the large block respectively;

controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate relatively moving with respect to the plurality of light emitting elements;

developing the photosensitive film which has been subjected to exposure processing by irradiation by the light emitting elements;

measuring a pattern line width after the development of the photosensitive film for each of the small blocks which have been subjected to the development to obtain correlation data between the illuminance set for the small block and the pattern line width; and

obtaining a required illuminance of irradiation to each of the large blocks from a target pattern line width of the photosensitive film set for each of the large blocks based on the correlation data.

3. The local exposure method as set forth in claim 1 or claim 2, further comprising the steps of:

after said step of obtaining a required illuminance of irradiation to

each of the large blocks based on the correlation data,

relatively moving the substrate to be treated with respect to the plurality of light emitting elements; and

selectively controlling light emission of the plurality of light emitting elements based on the obtained required illuminance to each of the large blocks, when the plurality of large blocks formed on the substrate are relatively moved below the plurality of light emitting elements.

4. The local exposure method as set forth in claim 3,

wherein after said step of obtaining a required illuminance of irradiation to each of the large blocks based on the correlation data, in said step of relatively moving the substrate to be treated with respect to the plurality of light emitting elements, the substrate is detected by a substrate detection sensor, and positional information about the substrate is obtained based on a detection signal about the substrate from the substrate detection sensor, time after acquisition of the detection signal, and a moving speed of the substrate.

5. The local exposure method as set forth in any one of claim 1 to claim 4,

wherein in said step of controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate moving with respect to the plurality of light emitting elements, one or a plurality of light emitting elements are controlled in light emission and perform irradiation at the set illuminance to each of the small blocks.

6. The local exposure method as set forth in any one of claim 1 to claim 5,

wherein in said step of controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate moving with respect to the plurality of light emitting elements, light emitted from the light emitting element is radiated to the photosensitive film on the substrate via a light diffusing plate.

7. The local exposure method as set forth in any one of claim 1 to claim 6,

wherein the light emitting element is a UV-LED element emitting UV light.

8. A local exposure apparatus locally performing exposure processing to a substrate to be treated having a photosensitive film formed thereon, said local exposure apparatus comprising:

a plurality of light emitting elements arranged in a line shape;

a substrate transfer means for relatively moving the substrate below said plurality of light emitting elements and in a direction intersecting with an arrangement direction of said light emitting elements;

a light emission drive part independently driving light emission of each of said plurality of light emitting elements; and

a control unit controlling said light emission drive part to selectively cause said plurality of light emitting elements to emit light to the substrate relatively moved by said substrate transfer means,

wherein said control unit divides the photosensitive film formed on the substrate into a plurality of large blocks and controls said light emission drive part to selectively cause said plurality of light emitting elements to emit light based on an illuminance set in advance for each of the large blocks.

9. The local exposure apparatus as set forth in claim 8,

wherein said control unit performs a measurement mode for deciding an illuminance to be set in advance for each of the large blocks, and

in the measurement mode,

divides an area in each of the plurality of large blocks into a plurality of small blocks, assigns illuminances different at predetermined distances to the divided small blocks respectively, and controls said light emission drive part to cause said plurality of light emitting elements to perform irradiation at the illuminances assigned to the respective small blocks,

further obtains correlation data between a residual film thickness in each of the small blocks after the development and the illuminance of the irradiation to each of the small blocks, and

sets, based on the correlation data, the illuminance of the irradiation to the small block where a residual film thickness of the photosensitive film after the development becomes consistent with a target film thickness as the illuminance for the large block.

10. The local exposure apparatus as set forth in claim 8,

wherein said control unit performs a measurement mode for deciding an illuminance to be set in advance for each of the large blocks, and

in the measurement mode,

divides an area in each of the plurality of large blocks into a plurality of small blocks, assigns illuminances different at predetermined distances to the divided small blocks respectively, and controls said light emission drive part to cause said plurality of light emitting elements to perform irradiation at the illuminances assigned to the respective small blocks,

further obtains correlation data between a pattern line width in each of

the small blocks after the development and the illuminance of the irradiation to each of the small blocks, and

sets, based on the correlation data, the illuminance of the irradiation to the small block where a pattern line width formed in the photosensitive film after the development becomes consistent with a target pattern line width as the illuminance for the large block.

11. The local exposure apparatus as set forth in claim 9 or claim 10,

wherein in the measurement mode, said control unit controls said light emission drive part to control light emission of one or a plurality of light emitting elements for each of the small blocks to perform irradiation at the set illuminance to each of the small blocks.

12. The local exposure apparatus as set forth in any one of claim 8 to claim 11, further comprising:

a light diffusing plate provided between said plurality of light emitting elements and the substrate to be treated,

wherein light emitted from the light emitting element is radiated to the photosensitive film on the substrate via said light diffusing plate.

13. The local exposure apparatus as set forth in any one of claim 8 to claim 12, further comprising:

a substrate detection sensor detecting the substrate moved by said moving means,

wherein said control unit obtains positional information about the substrate, based on a detection signal by said substrate detection sensor, time after acquisition of the detection signal, and a moving speed of the substrate.

14. The local exposure apparatus as set forth in any one of claim 8 to claim 13, further comprising:

an illuminance sensor movable forward and backward to a position below each of said plurality of light emitting elements, for detecting the illuminance of light radiated from said light emitting element and outputting the detected illuminance to said control unit,

wherein a distance between said illuminance sensor and said light emitting element is adjusted to be equal to a distance between an upper surface of the substrate and said light emitting element, and

wherein said control unit stores a drive current value of said light emitting element to a predetermined illuminance detected by said illuminance sensor and uses the drive current value as a drive current value of said light emitting element.

15. The local exposure apparatus as set forth in any one of claim 8 to claim 14,

wherein said light emitting element is a UV-LED element emitting UV light.

What is claimed is:

1. A local exposure method of locally performing exposure processing by dividing a photosensitive film formed on a substrate into a plurality of large blocks, relatively moving the substrate below a plurality of light emitting elements arranged in a line shape and in a direction intersecting with an arrangement direction of the light emitting elements, and selectively controlling light emission of the plurality of light emitting elements based on an illuminance set in advance for each of the large blocks, said local exposure method comprising the steps of:

dividing the large block into a plurality of small blocks;

setting irradiation illuminances different in a stepwise fashion for the small blocks in the large block respectively;

controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate moving with respect to the plurality of light emitting elements;

developing the photosensitive film which has been subjected to exposure processing by irradiation by the light emitting elements;

measuring a residual film thickness of the photosensitive film for each of the small blocks which have been subjected to the developing treatment to obtain correlation data between the illuminance set for the small block and the residual film thickness; and

obtaining a required illuminance of irradiation to each of the large blocks from a target residual film thickness of the photosensitive film set for each of the large blocks based on the correlation data.

2. The local exposure method as set forth in claim 1, further comprising

the steps of:

after said step of obtaining a required illuminance of irradiation to each of the large blocks based on the correlation data,

relatively moving the substrate with respect to the plurality of light emitting elements; and

selectively controlling light emission of the plurality of light emitting elements based on the obtained required illuminance to each of the large blocks, when the plurality of large blocks formed on the substrate are relatively moved below the plurality of light emitting elements.

3. The local exposure method as set forth in claim 1,

wherein in said step of controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate moving with respect to the plurality of light emitting elements, one or a plurality of light emitting elements are controlled in light emission and perform irradiation at the set illuminance to each of the small blocks.

4. The local exposure method as set forth in claim 1,

wherein in said step of controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate moving with respect to the plurality of light emitting elements, light emitted from the light emitting element is radiated to the photosensitive film on the substrate via a light diffusing plate.

5. A local exposure method of locally performing exposure processing by dividing a photosensitive film formed on a substrate into a plurality of large blocks, relatively moving the substrate below a plurality of light

emitting elements arranged in a line shape and in a direction intersecting with an arrangement direction of the light emitting elements, and selectively controlling light emission of the plurality of light emitting elements based on an illuminance set in advance for each of the large blocks, said local exposure method comprising the steps of:

dividing the large block into a plurality of small blocks;

setting irradiation illuminances different in a stepwise fashion for the small blocks in the large block respectively;

controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate moving with respect to the plurality of light emitting elements;

developing the photosensitive film which has been subjected to exposure processing by irradiation by the light emitting elements;

measuring a line width after the development of the photosensitive film for each of the small blocks which have been subjected to the developing treatment to obtain correlation data between the illuminance set for the small block and the line width; and

obtaining a required illuminance of irradiation to each of the large blocks from a target line width of the photosensitive film set for each of the large blocks based on the correlation data.

6. The local exposure method as set forth in claim 5, further comprising the steps of:

after said step of obtaining a required illuminance of irradiation to each of the large blocks based on the correlation data,

relatively moving the substrate with respect to the plurality of light

emitting elements; and

selectively controlling light emission of the plurality of light emitting elements based on the obtained required illuminance to each of the large blocks, when the plurality of large blocks formed on the substrate are relatively moved below the plurality of light emitting elements.

7. The local exposure method as set forth in claim 5,

wherein in said step of controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate moving with respect to the plurality of light emitting elements, one or a plurality of light emitting elements are controlled in light emission and perform irradiation at the set illuminance to each of the small blocks.

8. The local exposure method as set forth in claim 5,

wherein in said step of controlling light emission of the light emitting elements based on the irradiation illuminances respectively set for the small blocks for the photosensitive film on the substrate moving with respect to the plurality of light emitting elements, light emitted from the light emitting element is radiated to the photosensitive film on the substrate via a light diffusing plate.

9. A local exposure apparatus locally performing exposure processing to a substrate having a photosensitive film formed thereon, said local exposure apparatus comprising:

a plurality of light emitting elements arranged in a line shape;

a moving means for relatively moving the substrate below said plurality of light emitting elements and in a direction intersecting with an arrangement direction of said light emitting elements; and

a control unit selectively controlling light emission of said plurality of light emitting elements,

wherein said control unit divides the photosensitive film formed on the substrate into a plurality of large blocks and selectively controls light emission of said plurality of light emitting elements based on an illuminance set in advance for each of the large blocks.

10. The local exposure apparatus as set forth in claim 9,

wherein an area in the large block is divided into a plurality of small blocks, irradiation is performed to the substrate at illuminances different at predetermined distances which are assigned to the small blocks respectively as illuminances of irradiation to the divided small blocks,

wherein the illuminance of the irradiation to the small block where a residual film thickness becomes consistent with a target film thickness after the developing treatment is set as an illuminance for the large block, and

wherein said control unit controls light emission of said plurality of light emitting elements based on the illuminance set for each of the large blocks.

11. The local exposure apparatus as set forth in claim 9,

wherein an area in the large block is divided into a plurality of small blocks, irradiation is performed to the substrate at illuminances different at predetermined distances which are assigned to the small blocks respectively as illuminances of irradiation to the divided small blocks,

wherein a pattern line width formed in the photosensitive film after the developing treatment is measured, and the illuminance of the irradiation to the small block where a target line width is reached is set as an illuminance for the large block based on correlation data between the pattern line width

and the illuminance, and

wherein said control unit controls light emission of said plurality of light emitting elements based on the illuminance set for each of the large blocks.