What is claimed is:

1. A substrate processing apparatus that polishes a substrate by sliding the substrate on a polishing member, the substrate processing apparatus comprising:

a dresser that dresses the polishing member by swinging on the polishing member, the dresser being enabled to adjust a swing speed in a plurality of scanning areas set on the polishing member along a radial direction;

a height detection section configured to generate a pad profile by measuring values of a surface height of the polishing member along the radial direction of the polishing member;

a dresser load setting section that sets a dresser load to be applied by the dresser to the polishing member;

a pad height correction section configured to correct the pad profile by calculating a plurality of amounts of correction of the surface height of the polishing member according to an amount of variation from a reference load of the dresser load at a plurality of positions over the radial direction and correcting the measured values of the surface height with the plurality of amounts of correction at corresponding positions in the radial direction; and

a moving speed calculation section configured to adjust the swing speed of the dresser in each of the plurality of scanning areas based on the corrected pad profile; and

a correction data storage section that stores a plurality of pieces of pad height reference data along the radial

direction of the polishing member in association with a plurality of reference dresser loads,

wherein the pad height correction section is configured to calculate the amounts of correction of the surface height by interpolating the amounts of correction with the pad height reference data corresponding to the reference dresser load close to the set dresser load and the pad height reference data corresponding to the reference dresser load close to the reference load,

wherein the pad height reference data is provided for any of a plurality of types of the polishing member or for any of a plurality of types of a dressing surface of the dresser, and

wherein the pad height correction section is configured to calculate a pad height $PadH_x$ corresponding to a set dresser load DF_x according to a formula:

$$PadH_x = (PadH_1 - PadH_2) / (DF_1 - DF_2) \times (DF_x - DF_2) + PadH_2$$

wherein DF_1 and DF_2 are two dresser loads close to the DF_x, and $PadH_1$ and $PadH_2$ are pad height reference data corresponding to the dresser loads DF_1 and DF_2.

2. The substrate processing apparatus according to claim 1, wherein the pad height correction section is configured to revise the amounts of correction of the surface height based on an operating time of the polishing member or an adjustment coefficient corresponding to the number of times dressing of the dresser is performed.

3. The substrate processing apparatus according to claim 1, wherein the height detection section is configured to measure the surface height of the polishing member in a plurality of monitoring areas set in advance along the radial direction of the polishing member.

4. The substrate processing apparatus according to claim 1, comprising:

a dress model matrix creation section configured to create a dress model matrix defined from a plurality of monitoring areas, dress models, and the plurality of scanning areas; and

an evaluation index creation section configured to calculate a height profile predicted value using the dress model and the swing speed or a staying time in each of the plurality of scanning areas and set an evaluation index based on a difference from a target value of the height profile of the polishing member, wherein

the moving speed calculation section is configured to calculate the swing speed of the dresser in each of the plurality of scanning areas based on the evaluation index.

5. A method for dressing a polishing member using a substrate polishing apparatus to re-form irregularities on a surface of the polishing member by swinging a dresser on the polishing member, the dresser being enabled to adjust a swing speed in a

plurality of scanning areas set on the polishing member along a swing direction, the method comprising:

generating a pad profile by measuring values of a surface height of the polishing member along a radial direction of the polishing member based on input from a pad height sensor;

applying a dresser load by the dresser to the polishing member based on a set dresser load;

correcting the pad profile based on the measured values of the surface height of the dresser with a plurality of amounts of correction at corresponding positions in the radial direction by calculating the plurality of amounts of correction of the surface height of the polishing member according to an amount of variation from a reference load of the dresser load at a plurality of positions over the radial direction; and

adjusting the swing speed of the dresser in each scanning area based on the corrected pad profile while dressing the polishing member,

wherein calculating the amounts of correction of the surface height comprises interpolating the amounts of correction with the pad height reference data corresponding to a reference dresser load close to the set dresser load and pad height reference data corresponding to the reference dresser load close to the reference load,

wherein the pad height reference data is provided for any of a plurality of types of the polishing member or for any of a plurality of types of a dressing surface of the dresser, and

wherein a pad height $PadH_x$ corresponding to a set dresser load DF_x according to a formula:

$$PadH_x = (PadH_1 - PadH_2) / (DF_1 - DF_2) \times (DF_x - DF_2) + PadH_2$$

wherein DF_1 and DF_2 are two dresser loads close to the DF_x, and $PadH_1$ and $PadH_2$ are pad height reference data corresponding to the dresser loads DF_1 and DF_2.

6. The method for dressing a polishing member of claim 5, wherein the polishing member is a polishing pad and the substrate polishing apparatus is a semiconductor polishing apparatus.

7. A non-transitory computer-readable recording medium for use with a polishing apparatus that swings a dresser on a polishing member for polishing a substrate to dress the polishing member to re-form irregularities on a surface of the polishing member, a swing speed of the dresser being adjustable in a plurality of scanning areas set on the polishing member along a swing direction, the recording medium comprising an executable code that causes a computer of the polishing apparatus to execute:

generating a pad profile by measuring values of a surface height of the polishing member along a radial direction of the polishing member based on input from a pad height sensor;

causing a dresser load to be applied by the dresser to the polishing member by setting the dresser load;

correcting the pad profile based on the measured values of the surface height of the dresser with a plurality of amounts of

correction at corresponding positions in the radial direction by calculating the plurality of amounts of correction of the surface height of the polishing member according to an amount of variation from a reference load of the dresser load at a plurality of positions over the radial direction; and

adjusting the swing speed of the dresser in each scanning area based on the corrected pad profile while dressing the polishing member,

wherein calculating the amounts of correction of the surface height comprises interpolating the amounts of correction with the pad height reference data corresponding to a reference dresser load close to the set dresser load and pad height reference data corresponding to the reference dresser load close to the reference load,

wherein the pad height reference data is provided for any of a plurality of types of the polishing member or for any of a plurality of types of a dressing surface of the dresser, and

wherein a pad height $PadH_x$ corresponding to a set dresser load DF_x according to a formula:

$$PadH_x = (PadH_1 - PadH_2) / (DF_1 - DF_2) \times (DF_x - DF_2) + PadH_2$$

wherein DF_1 and DF_2 are two dresser loads close to the DF_x, and $PadH_1$ and $PadH_2$ are pad height reference data corresponding to the dresser loads DF_1 and DF_2.

8. The non-transitory computer-readable recording medium of claim 7, wherein the polishing member is a polishing pad and the polishing apparatus is a semiconductor polishing apparatus.