WHAT IS CLAIMED IS:

1. A polishing apparatus capable of polishing a target, the polishing apparatus comprising:

a state acquisition section capable of acquiring a state variable including at least data on a state of the target of data on a state of a device making up the polishing apparatus and the data on the state of the target; and

a learning section that has learned a relationship between the state variable and a change in film thickness of the target using a neural network, the learning section being capable of receiving the state variable from the state acquisition section to predict the change and/or receiving the state variable from the state acquisition section to determine that the change is abnormal,

wherein the data on the state of a device making up the polishing apparatus includes at least one of data on the arrangement of the device, data on an operation state of the device, and data on the state of exhaustion of the device,

the data on a state of the target includes at least one of data detected by a film thickness detection section capable of detecting a film thickness of the target, data detected by a temperature detection section capable of detecting a temperature of the target, data detected by a pressure detection section capable of detecting a pressure applied to the target, and data on characteristics of the target, and

the data detected by the film thickness detection section includes at least one of (i) table torque applied to a rotational table capable of rotating a polishing pad to polish the target, (ii) arm torque applied to an arm holding a top ring capable of holding the target, (iii) a current value of a first electric motor for driving to rotate the rotational table, (iv) a current value of a second electric motor for driving to rotate the top ring, (v) a current value of a third electric motor for swinging the arm.

2. The polishing apparatus according to claim 1, wherein

the data on the arrangement of the device includes at least one of data on the position of the top ring capable of holding the target, data on the position of the rotational table capable of rotating the polishing pad to polish the target, data on the position of the arm holding the top ring, and data on the position of the dresser capable of performing dressing the polishing pad,

the data on the operation state of the device includes at least one of data on the number of revolutions of the top ring, and data on the number of revolutions of the rotational table,

the data on a state of exhaustion of the device includes at least one of data on a use time of a consumable part included in the polishing apparatus, and data on a consumed amount of the consumable part, and

the data on characteristics of the target includes at least one of data on a material of the target, and data on a film thickness and a circuit pattern on the target before being polished by the polishing apparatus.

3. The polishing apparatus according to claim 1, further comprising:

a determination data acquisition section that acquires determination data indicating presence or absence of abnormality or degree of abnormality of the polishing apparatus,

wherein the learning section learns a change in film thickness of the target based on a dataset created based on a combination of the state variable and the determination data.

4. The polishing apparatus according to claim 1, wherein

the learning section receives the state variable from the state acquisition section to learn the change.

5. A polishing method causing a computer to execute:

a state acquiring step of acquiring a state variable including at least data on a state of the target of data on a state of a device making up the polishing apparatus and the data on the state of the target; and

an estimating step of causing a learning section that has learned a relationship between the state variable and a change in film thickness of the target using a neural network to receive the acquired state variable to predict the change and/or to receive the acquired state variable to determine that the change is abnormal,

wherein the data on the state of a device making up the polishing apparatus includes at least one of data on the arrangement of the device, data on an operation state of the device, and data on the state of exhaustion of the device,

the data on a state of the target includes at least one of data detected by a film thickness detection section capable of detecting a film thickness of the target, data detected by a temperature detection section capable of detecting a temperature of the target, data detected by a pressure detection section capable of detecting a pressure applied to the target, and data on characteristics of the target, and

the data detected by the film thickness detection section includes at least one of (i) table torque applied to a rotational table capable of rotating a polishing pad to polish the target, (ii) arm torque applied to an arm holding a top ring capable of holding the target, (iii) a current value of a first electric motor for driving to rotate the rotational table, (iv) a current value of a second electric motor for driving to rotate the top ring, (v) a current value of a third electric motor for swinging the arm.

6. A machine learning apparatus capable of learning a change in film thickness of a target to be polished by a polishing apparatus, the machine learning apparatus comprising:

a state acquisition section capable of acquiring a state variable including at least data on a state of the target ~~date~~ of data on a state of a device making up the polishing apparatus and the data on the state of the target; and

a learning section that has learned a relationship between the state variable and a change in film thickness of the target using a neural network, the learning section being capable of receiving the state variable from the state acquisition section to predict the change and/or receiving the state variable from the state acquisition section to determine that the

change is abnormal,

wherein the data on the state of a device making up the polishing apparatus includes at least one of data on the arrangement of the device, data on an operation state of the device, and data on the state of exhaustion of the device,

the data on a state of the target includes at least one of data detected by a film thickness detection section capable of detecting a film thickness of the target, data detected by a temperature detection section capable of detecting a temperature of the target, data detected by a pressure detection section capable of detecting a pressure applied to the target, and data on characteristics of the target, and

the data detected by the film thickness detection section includes at least one of (i) table torque applied to a rotational table capable of rotating a polishing pad to polish the target, (ii) arm torque applied to an arm holding a top ring capable of holding the target, (iii) a current value of a first electric motor for driving to rotate the rotational table, (iv) a current value of a second electric motor for driving to rotate the top ring, (v) a current value of a third electric motor for swinging the arm.

7. A machine learning apparatus capable of learning a change in film thickness of a target to be polished by a polishing apparatus, the machine learning apparatus comprising:

a state acquisition section capable of acquiring a state variable including at least data on a state of the target of data on a state of a device making up the polishing apparatus and the data on the state of the target; and

a learning section capable of learning a relationship between the state variable and a change in film thickness of the target using a neural network, and receiving the state variable from the state acquisition section to predict the change and/or receiving the state variable from the state acquisition section to determine that the change is abnormal,

wherein the data on the state of a device making up the polishing apparatus includes at least one of data on the arrangement of the device, data on an operation state of the device, and data on the state of exhaustion of the device,

the data on a state of the target includes at least one of data detected by a film thickness detection section capable of detecting a film thickness of the target, data detected by a temperature detection section capable of detecting a temperature of the target, data detected by a pressure detection section capable of detecting a pressure applied to the target, and data on characteristics of the target, and

the data detected by the film thickness detection section includes at least one of (i) table torque applied to a rotational table capable of rotating a polishing pad to polish the target, (ii) arm torque applied to an arm holding a top ring capable of holding the target, (iii) a current value of a first electric motor for driving to rotate the rotational table, (iv) a current value of a second electric motor for driving to rotate the top ring, (v) a current value of a third electric motor for swinging the arm.