# CLAIMS

Claim 1. A fouling impact assessment device comprising:

acquisition means for acquiring fouling levels of a plurality of regions of a surface of a hull of a ship, the fouling levels resulting from navigation of the ship; and

calculation means for calculating a frictional resistance of an entirety of the hull, by calculating a plurality of frictional resistances of the plurality of regions using coefficients of frictional resistance corresponding to the fouling levels of the plurality of regions, and summing the plurality of frictional resistances, and

wherein the calculation means calculates a value related to required horsepower from an increase in the frictional resistance of the entirety of the hull resulting from the navigation.

Claim 2. The fouling impact assessment device according to claim 1,

wherein the acquisition means further acquires position information indicating positions of the plurality of regions on the hull, and

the calculation means calculates, for each of the plurality of regions, a frictional resistance of a region, using a flow speed at a position indicated by the position information of the region and a coefficient of frictional resistance corresponding to a fouling level of the region, and calculates the frictional resistance of the entirety of the hull by summing frictional resistances of the plurality of regions.

Claim 3. The fouling impact assessment device according to claim 1, further comprising:

reception means for receiving images of the plurality of regions captured by an underwater moving body;

determination means for determining the fouling levels of the

plurality of regions using the images; and

mapping means for associating, for each of the plurality of regions, position information indicating a position of a region with a fouling level of the region.

Claim 4. The fouling impact assessment device according to claim 3,

wherein the underwater moving body captures the images along a weld line of the hull, and

the mapping means specifies positions of the plurality of regions on the hull, based on the weld line included in the images.

Claim 5. The fouling impact assessment device according to claim 3,

wherein the mapping means specifies positions of the plurality of regions on the hull, based on a position of the underwater moving body measured using an acoustic lighthouse.

Claim 6. The fouling impact assessment device according to claim 3,

wherein the mapping means specifies positions of the plurality of regions on the hull, based on a position of the underwater moving body measured using an inertial navigation device.

Claim 7. The fouling impact assessment device according to claim 3 or 4,

wherein the plurality of regions on the surface of the hull are provided with marks indicating positions of the plurality of regions on the hull, and

the mapping means uses the marks included in the images to specify the positions of the plurality of regions on the hull.

Claim 8. The fouling impact assessment device according to claim 1, further comprising:

reception means for receiving images of the plurality of regions

captured by an underwater moving body that includes an arm and a camera, using the camera together with a fouling sample plate held alongside the surface of the hull by the arm; and

determination means for determining the fouling levels of the plurality of regions, based on a similarity between fouling samples of the fouling sample plate included in the images and each of the plurality of regions.

Claim 9. The fouling impact assessment device according to claim 1, further comprising:

storage means for storing a history of the frictional resistance of the entirety of the hull or fuel consumption calculated from the frictional resistance, and a period in which maintenance work for reducing the frictional resistance of the hull is performed; and

analysis means for performing trend analysis for predicting future change in fuel consumption in a case where the maintenance work is performed at a predetermined time interval, based on the history and the period.

Claim 10. The fouling impact assessment device according to claim 1, further comprising:

reception means for receiving input of an image, captured together with a fouling sample plate by image capture means, of a target region between a first waterline in a first draft state of the hull and a second waterline in a second draft state different from the first draft state; and

determination means for determining a fouling level of the target region, based on a similarity between the target region and fouling samples of the fouling sample plate included in the image, and

wherein the calculation means calculates the frictional resistance of the entirety of the hull, further using a coefficient of frictional resistance

corresponding to the fouling level of the target region.

Claim 11. The fouling impact assessment device according to claim 10,

wherein the calculation means calculates an increase in frictional resistance of the target region caused by fouling, based on a difference in required horsepower between the first draft state and the second draft state.

Claim 12. A program for causing a computer to execute:

a step of acquiring fouling levels of a plurality of regions of a surface of a hull of a ship, the fouling levels resulting from navigation of the ship;

a step of calculating a frictional resistance of an entirety of the hull, by calculating frictional resistances of the plurality of regions using coefficients of frictional resistance corresponding to the fouling levels of the plurality of regions, and summing the frictional resistances; and

a step of calculating a value related to required horsepower from an increase in the frictional resistance of the entirety of the hull resulting from the navigation.