CLAIMS

1. A measuring device suitable for measuring a flange-to-flange gap between flanges tightened by a plurality of bolts and nuts with a gasket interposed between the flanges, the measuring device comprising:

a light irradiation unit that emits thin light to generate thin light images on the flanges, the gap between the flanges being interposed between the thin light images;

an imaging unit that acquires an image including the thin light images;

a measurement unit that extracts thin light image data and flange edge data from the image and measures the gap or a gap difference between the flanges; and

a housing that includes a positioning guide,

wherein the positioning guide includes:

abutting units that abut on peripheral surfaces of the flanges with a measurement position interposed between the abutting units; and

a guide projection formed at a part of the abutting units to be inserted in the gap.

2. The measuring device according to claim 1, wherein the light irradiation unit causes the thin light images to be generated at the measurement position related to a position of the bolt or a bolt tightening position.

3. A measuring device suitable for measuring a flange-to-flange gap between flanges tightened by a plurality of bolts and nuts with a gasket interposed between the flanges, the measuring device comprising:

a light irradiation unit that emits thin light to generate thin light images on the flanges, the gap between the flanges being interposed between the thin light images;

an imaging unit that acquires an image including the thin light images;

a measurement unit that extracts thin light image data

and flange edge data from the image and measures the gap or a gap difference between the flanges; and

an information presenting unit that presents identification information of the flange, a position of the bolt or a bolt tightening position, and a measurement result of the gap or the gap, the presented measurement result being related to the presented identification information in presentation of the measurement result and the identification information.

4. The measuring device according to claim 1, wherein the housing inserts the positioning guide in the gap between the flanges and is positioned at the measurement position of the flanges by the abutting units and the guide projection.

5. The measuring device according to claim 1, wherein the housing is provided with a grip unit and an imaging switch, and the imaging switch is operable while the grip unit is gripped.

6. The measuring device according to claim 1, further comprising a communication unit that transmits measurement data,

wherein the measurement data is provided to an information terminal connected to the communication unit by wire or wirelessly.

7. A program for causing a computer to fulfill:

a function of emitting thin light from a housing to generate thin light images on flanges, a gap between the flanges being interposed between the thin light images;

a function of acquiring an image including the thin light images;

a function of extracting thin light image data and flange edge data from the image and measuring the gap or a gap difference between the flanges; and

a function of presenting identification information of the flange, a position of a bolt or a bolt tightening position,

and a measurement result of the gap or the gap difference, the presented measurement result being related to the presented identification information in presentation of the measurement result and the identification information.

8. A flange-to-flange gap measuring method measuring a gap between flanges tightened by a plurality of bolts and nuts with a gasket interposed between the flanges, the flange-to-flange gap measuring method comprising:

inserting a guide projection of a positioning guide including abutting units and the guide projection in the gap between the flanges, causing the abutting units to abut on peripheral surfaces of the flanges with a measurement position interposed between the abutting units, and positioning a housing at the measurement position between the flanges by the abutting units and the guide projection;

emitting thin light by means of a light irradiation unit to generate thin light images on the flanges, the gap between the flanges being interposed between the thin light images;

acquiring an image including the thin light images by means of an imaging unit; and

extracting thin light image data and flange edge data from the image and measuring the gap or a gap difference between the flanges by means of a measurement unit.

9. A flange-to-flange gap measuring method measuring a gap between flanges tightened by a plurality of bolts and nuts with a gasket interposed between the flanges, the flange-to-flange gap measuring method comprising:

positioning a housing at a measurement position between the flanges;

emitting thin light by means of a light irradiation unit to generate thin light images on the flanges, the gap between the flanges being interposed between the thin light images;

acquiring an image including the thin light images by means of an imaging unit;

extracting thin light image data and flange edge data from the image and measuring the gap or a gap difference between the flanges by means of a measurement unit; and

presenting identification information of the flange, a position of a bolt or a bolt tightening position, and a measurement result of the gap or the gap difference, the presented measurement result being related to the presented identification information in presentation of the measurement result and the identification information.