CLAIMS

1. An optical cable monitoring system for monitoring a health of optical cables comprising a plurality of optical fibers, the system comprising:

an optical power detector comprising a light power monitor, a failure determination unit and an alert signal generator, the light power monitor measuring light intensity of an extracted portion of communication light transmitted through each optical fiber and obtaining communication light intensity based on the measured light intensity, the failure determination unit determining presence of failure in each optical fiber based on the measurement result of the light power monitor, and the alert signal generator generating an alert signal when failure is determined to occur by the failure determination unit; and

a monitoring device that receives the alert signal from the optical power detector,

wherein the optical power detector comprises a transmitter that transmits data of communication light intensity of each optical fiber obtained by the light power monitor, and

wherein the monitoring device comprises a failure's cause conjecturing unit that conjectures a cause of failure based on the data of communication light intensity of each optical fiber received from the optical power detector, and information of a number or arrangement of the optical fiber in which the failure occur.

2. An optical cable monitoring system for monitoring a health of optical cables comprising a plurality of optical fibers, the system comprising:

an optical power detector comprising a light power monitor, a failure determination unit and an alert signal generator, the light power monitor measuring light intensity of an extracted portion of communication light transmitted through each optical fiber and obtaining communication light intensity based on the measured light intensity, the failure determination unit determining presence of failure in each optical fiber based on the measurement result of the light power monitor, and the alert signal generator

generating an alert signal when failure is determined to occur by the failure determination unit;

an Optical Time-Domain Reflectrometer (OTDR) device that injects optical pulses into the optical fiber to be measured and measures return light from the optical fiber; and

a monitoring device comprising an OTDR controller that causes the OTDR device to measure return light from the optical fiber of the failure-occurring optical cable when receiving the alert signal from the optical power detector,

wherein the optical power detector comprises a transmitter that transmits data of communication light intensity of each optical fiber obtained by the light power monitor, and

wherein the monitoring device comprises a failure's cause conjecturing unit that conjectures a cause of failure based on the data of communication light intensity of each optical fiber received from the optical power detector, and information of a number or arrangement of the optical fiber in which the failure occurs.

3. The optical cable monitoring system according to claim **2**, wherein the monitoring device comprises a fault location pinpointing unit that pinpoints a fault location in a longitudinal direction of the optical cable based on the measurement result of the OTDR controller.

4. The optical cable monitoring system according to claim **3**, wherein the monitoring device comprises a map location pinpointing unit that pinpoints a fault location on a map based on the fault location pinpointed by the fault location pinpointing unit.

5. The optical cable monitoring system according to any one of claims **2** to **4**, wherein the optical cable comprises a monitoring optical fiber that is the optical fiber to be subjected to measurement by the OTDR device, and

wherein the OTDR controller, when received an alert signal from the optical power detector, causes the OTDR device to measure return light from the monitoring

optical fiber of the failure-occurring optical cable.

6. The optical cable monitoring system according to claim **5**, wherein the optical cable comprises not less than three of the monitoring optical fibers that are arranged at distances in a circumferential direction of the optical cable and at an outermost side of the optical cable.

7. The optical cable monitoring system according to any one of claims **2** to **6**, wherein the OTDR controller performs regular inspection control under which the OTDR device conducts measurement on all the optical cables as monitoring subjects at every predetermined time interval.

8. The optical cable monitoring system according to any one of claims **2** to **7**, wherein the optical power detector comprises a light leakage portion that leaks a portion of communication light, and

wherein the light power monitor comprises a light-receiving element for receiving the leaking light leaking out at the light leakage portion, an amplifier circuit for converting a current signal of the light-receiving element into a voltage signal and also amplifying the signal, and a calculation unit for calculating communication light intensity based on output voltage of the amplifier circuit.

9. The optical cable monitoring system according to claim 8, wherein the optical power detector comprises a temperature sensor for detecting temperature inside the optical power detector, and

wherein the calculation unit of the light power monitor comprises a temperature correction section for correcting communication light intensity based on the temperature detected by the temperature sensor.

10. The optical cable monitoring system according to claim 9, wherein the calculation unit

comprises a temperature correction map containing preset inclination correction factor k and bias correction factor b with respect to temperature, and

wherein the temperature correction section refers to the temperature correction map to obtain the inclination correction factor k and bias correction factor b corresponding to the temperature detected by the temperature sensor and corrects communication light intensity by using the formula L = Lm x k – b, where L is communication light intensity after correction and Lm is communication light intensity before correction.

11. An optical cable monitoring system for monitoring a health of optical cables comprising a plurality of optical fibers, the system comprising:

an optical power detector comprising a light power monitor and a transmitter, the light power monitor measuring light intensity of an extracted portion of communication light transmitted through each optical fiber and obtaining communication light intensity based on the measured light intensity, and the transmitter transmitting data of communication light intensity of each optical fiber obtained by the light power monitor; and

a monitoring device comprising an failure’s cause conjecturing unit that conjectures a cause of failure based on the data of communication light intensity of each optical fiber received from the optical power detector, and information of a number or arrangement of the optical fiber in which the failure occurs.