WE CLAIM:

1. An inspection and measurement system being characterized in comprising:

an inspection and measurement lighting device configured to irradiate an inspection object with inspection light, the inspection and measurement lighting device comprising a shielding mask and/or a filtering means for selectively transmitting light that has a specific attribute and forming a solid angle region composed of the light that has the specific attribute, and being capable of rendering shapes and inclines of optical axes, of irradiation solid angles of the inspection light applied to respective points on the inspection object substantially uniform at all the respective points on the inspection object at the same time irrespective of distances from the inspection and measurement lighting device to the respective points on the inspection object; and

an imaging device configured to image object light including regularly reflected light or regularly transmitted light or scattered light reflected or transmitted by the respective points on the inspection object,

the inspection and measurement system being configured to identify incline angles of surfaces in the vicinity of respective points on the inspection object by sensing a variation in optical axes of solid angles of the regularly reflected light or the regularly transmitted light at the respective points on the inspection object as brightness thereof, based on inclusive relations with observation solid angles formed at the respective points on the inspection object by the imaging device, or by sensing a variation in illuminance of the inspection light at the respective points on the inspection object as a variation in brightness of the scattered light,

wherein, in a region in which incline angles cannot be continuously identified, a variation in the solid angles of the regularly reflected light or the regularly transmitted light in the vicinity of that region is sensed as brightness thereof based on the inclusive relations with the observation solid angles, and at least a difference in height between regions adjacent to that

region is calculated using information regarding the sensed brightness, information regarding a geometric shape of that region, and an effective half plane angle in which both the irradiation solid angle and the observation solid angle function effectively, and thereby three-dimensional characteristics of a surface of the inspection object can be specified.

2. The inspection and measurement system according to claim 1, the inspection and measurement system being configured such that:

the irradiation solid angles of the inspection light applied to the respective points on the inspection object are set such that, in each irradiation solid angle, a plurality of solid angle regions having different optical attributes are radially arranged around an optical axis thereof, and

the imaging device is capable of selectively imaging different optical attributes of the object light, and incline angles, or both the incline angles and incline directions, of surfaces in the vicinity of the respective points on the inspection object are identified by the imaging device sensing a variation in the optical axes of the solid angles of the regularly reflected light or the regularly transmitted light at the respective points on the inspection object, based on the inclusive relations with the observation solid angles formed at the respective points on the inspection object by the imaging device, as a variation in brightness for each of the optical attributes resulting from the plurality of solid angle regions of the inspection light, or by the imaging device sensing a variation in illuminance at the respective points on the inspection object for each of the optical attributes resulting from the plurality of solid angle regions of the inspection light as a variation in brightness of the scattered light for each optical attribute,

wherein, in a region in which incline angles cannot be continuously identified, a variation in the solid angles of the regularly reflected light or the regularly transmitted light in the vicinity of that region is sensed as a variation in brightness for each of the optical attributes resulting from the plurality of solid angle regions of the inspection light, and at least a difference in height between regions adjacent to that region is

calculated, and thereby three-dimensional characteristics of a surface of the inspection object can be specified.

3. The inspection and measurement system according to claim 2,

wherein the observation solid angles at the respective points on the inspection object are each set to be smaller than a corresponding irradiation solid angle, and, in the plurality of solid angle regions that are formed in the irradiation solid angle and that have different optical attributes, the optical attributes are each continuously and smoothly varied.

4. The inspection and measurement system according to any one of claims 1 to 3,

wherein, in the inspection and measurement lighting device configured to irradiate an inspection object with inspection light, the inspection light applied to respective points on the inspection object is polarized,

the imaging device configured to image object light reflected or transmitted by the respective points on the inspection object is capable of selectively imaging a variation in the object light based on a polarization state of the object light, and the object light returned from the respective points on the inspection object is classified into regularly reflected light or regularly transmitted light, or scattered light,

if the object light is regularly reflected light or regularly transmitted light, brightness thereof is sensed based on the inclusive relations with the observation solid angles formed at the respective points on the inspection object by the imaging device,

if the object light is scattered light, a variation in brightness with respect to the scattered light is sensed, and

thereby three-dimensional characteristics of a surface of the inspection object can be specified.

5. The inspection and measurement system according to any one of claims 1 to 3,

wherein the imaging device configured to image object light reflected or transmitted by respective points on the inspection

object is capable of imaging and recording brightness of the object light as a luminance value in a floating-point format,

whether the object light returned from the respective points on the inspection object is regularly reflected light or regularly transmitted light, or scattered light can be determined as being a region that is divided according to a band of brightness thereof,

if the object light is regularly reflected light or regularly transmitted light, brightness thereof is sensed based on the inclusive relations with the observation solid angles formed at the respective points on the inspection object by the imaging device,

if the object light is scattered light, a variation in brightness with respect to the scattered light is sensed, and

thereby three-dimensional characteristics of a surface of the inspection object can be specified.

6. The inspection and measurement system according to any one of claims 1 to 3,

wherein, in the imaging device configured to image object light reflected or transmitted by respective points on the inspection object,

a first captured image is captured by applying imaging conditions within a range in which desired brightness of regularly reflected light or regularly transmitted light of the object light does not exceed the maximum brightness that can be imaged,

a second captured image is captured by applying imaging conditions within a range in which desired brightness of scattered light of the object light is equal to or higher than the minimum brightness that can be imaged,

whether the object light returned from the respective points on the inspection object is regularly reflected light or regularly transmitted light, or scattered light can be determined as being a region that is divided according to a band of brightness thereof,

if the object light is regularly reflected light or regularly transmitted light, brightness thereof is sensed based on the inclusive relations with the observation solid angles formed at the respective points on the inspection object by the imaging device,

if the object light is scattered light, a variation in brightness with respect to the scattered light is sensed, and

thereby three-dimensional characteristics of a surface of the inspection object can be specified.

7. The inspection and measurement system according to any one of claims 1 to 6,

wherein, in the inspection and measurement lighting device, a half mirror configured to change an irradiation direction of the inspection light and to transmit light from the inspection object so that the light can be imaged by the imaging device is provided, and the optical axes of the irradiation solid angles of the inspection light at the respective points on the inspection object substantially coincide with optical axes of the observation solid angles of the imaging device at the respective points on the inspection object.

8. An inspection and measurement method for identifying a three-dimensional shape of an inspection object using the inspection system according to any one of claims 1 to 7,

wherein a three-dimensional shape of an inspection object is identified based on a variation in at least one of brightness, shapes of solid angles, and inclines of the solid angles of the object light.