CLAIMS

1. An overhead contact line fitting abnormality detection device, comprising:

a first line sensor camera and a second line sensor camera that capture images of overhead contact line fittings using fisheye lenses while a railway vehicle is running, the first line sensor camera and the second line sensor camera being spaced apart by a predetermined distance on a left side and a right side relative to a direction of travel of the railway vehicle;

a trimming unit that trims an area outside a target image-capturing range from a first image captured by the first line sensor camera and trims an area outside a target image-capturing range from a second image captured by the second line sensor camera; and

a horizontal inversion processing unit that horizontally inverts either the first image that was trimmed or the second image that was trimmed such that orientations of the overhead contact line fittings that were captured match with respect to a center position of the first line sensor camera in the first image and a center position of the second line sensor camera in the second image,

wherein, from among the first image that was trimmed and the second image that was trimmed, the overhead contact line fitting abnormality detection device provides an image that was not horizontally inverted by the horizontal inversion processing unit and an inverted image obtained by the horizontal inversion processing unit horizontally inverting either the first image that was trimmed or the second image that was trimmed as processed images for detecting an abnormality in the overhead contact line fittings.

2. The overhead contact line fitting abnormality detection device according to claim 1, further comprising:

an image left-right splitting processing unit that splits the first image left and right from the center position of the first line sensor camera in the first image and splits the second image left and right from the center position of the second line sensor camera in the second image; and

an outer-side image removal processing unit that removes, from among split images obtained by splitting the first image, a split image corresponding to an outer side of the railway vehicle from the center position of the first line sensor

camera, and removes, from among split images obtained by splitting the second image, a split image corresponding to the outer side of the railway vehicle from the center position of the second line sensor camera,

wherein the trimming unit

trims an area outside the target image-capturing range from a first split image remaining without being removed, and trims an area outside the target image-capturing range from a second split image remaining without being removed, and

the horizontal inversion processing unit

horizontally inverts either the first split image that was trimmed or the second split image that was trimmed such that the orientations of the overhead contact line fittings captured in the first split image that was trimmed and the orientations of the overhead contact line fittings captured in the second split image that was trimmed match.

3. The overhead contact line fitting abnormality detection device according to claim 1, further comprising:

an image left-right splitting processing unit that splits the first image left and right from the center position of the first line sensor camera in the first image and splits the second image left and right from the center position of the second line sensor camera in the second image,

wherein the trimming unit

trims an area outside the target image-capturing range from a first left split image and a first right split image obtained by splitting the first image left and right, and trims an area outside the target image-capturing range from a second left split image and a second right split image obtained by splitting the second image left and right, and

the horizontal inversion processing unit

horizontally inverts either the first left split image that was trimmed or the first right split image that was trimmed such that the orientations of the overhead contact line fittings in the first left split image and the first right split image that were trimmed match, and horizontally inverts either the second left split image that was trimmed or the second right split image that was trimmed such that the orientations of the overhead contact line fittings in the second left split image and the second

right split image that were trimmed match.

4. An overhead contact line fitting abnormality detection method, comprising:

a step of capturing images of overhead contact line fittings while a railway vehicle is running using a first line sensor camera and a second line sensor camera which comprise fisheye lenses and which are spaced apart by a predetermined distance on a left side and a right side relative to a direction of travel of the railway vehicle;

a step of trimming an area outside a target image-capturing range from a first image captured by the first line sensor camera and trimming an area outside a target image-capturing range from a second image captured by the second line sensor camera;

a step of horizontally inverting either the first image that was trimmed or the second image that was trimmed such that orientations of the overhead contact line fittings that were captured match with respect to a center position of the first line sensor camera in the first image and a center position of the second line sensor camera in the second image; and

a step of, from among the first image that was trimmed and the second image that was trimmed, providing an image that was not horizontally inverted by the step of horizontally inverting and an inverted image obtained by the step of horizontally inverting either the first image that was trimmed or the second image that was trimmed as processed images for detecting an abnormality in the overhead contact line fittings.

5. The overhead contact line fitting abnormality detection method according to claim 4, further comprising:

a step of splitting the first image left and right from the center position of the first line sensor camera in the first image and splitting the second image left and right from the center position of the second line sensor camera in the second image; and

a step of removing, from among split images obtained by splitting the first image, a split image corresponding to an outer side of the railway vehicle from the center position of the first line sensor camera, and removing, from among split images obtained by splitting the second image, a split image corresponding to the

outer side of the railway vehicle from the center position of the second line sensor camera,

wherein the step of trimming an area outside a target image-capturing range

trims an area outside the target image-capturing range from a first split image remaining without being removed, and trims an area outside the target image-capturing range from a second split image remaining without being removed, and

the step of horizontally inverting

horizontally inverts either the first split image that was trimmed or the second split image that was trimmed such that the orientations of the overhead contact line fittings captured in the first split image that was trimmed and the orientations of the overhead contact line fittings captured in the second split image that was trimmed match.

6. The overhead contact line fitting abnormality detection method according to claim 4, further comprising:

a step of splitting the first image left and right from the center position of the first line sensor camera in the first image and splitting the second image left and right from the center position of the second line sensor camera in the second image,

wherein the step of trimming an area outside a target image-capturing range

trims an area outside the target image-capturing range from a first left split image and a first right split image obtained by splitting the first image left and right, and trims an area outside the target image-capturing range from a second left split image and a second right split image obtained by splitting the second image left and right, and

the step of horizontally inverting

horizontally inverts either the first left split image that was trimmed or the first right split image that was trimmed such that the orientations of the overhead contact line fittings in the first left split image and the first right split image that were trimmed match, and horizontally inverts either the second left split image that was trimmed or the second right split image that was trimmed such that the orientations

of the overhead contact line fittings in the second left split image and the second right split image that were trimmed match.