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Inspection of cable-stayed bridge cables using a robot

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ABSTRACT

Currently, all bridges in Japan are required to be inspected once every five years. Close visual inspection should be carried out for all members. Cables in cable-stayed bridges are extremely important members. However, it is very difficult to perform close visual inspection since it is located at a very high place. They are visually inspected from the road surface or from an aerial work platform in general. There is also an inspection method that involves close visual inspection by working at heights using ropes, but there are many issues such as safety and prolonged on-site construction period. Against this background, we developed an inspection robot for cable-stayed bridge cables. The developed robot has a structure surrounding the inspected cable with the frame. It has four propellers and eight guide rollers on the outside and inside of the frame, respectively. In addition, four video cameras are installed, and videos of the entire cable surface can be taken by them. In this paper, the outline of the developed robot is introduced, and the results of inspections, examples of damage to cable protection tubes, and comparative verification results of inspections using this robot and ropes are reported.

Keywords: Cable-stayed bridges, close visual inspection, inspection robot, inspection method

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