DESCRIPTION

Title of the Invention: NAVIGATION SUPPORT SYSTEM FOR A SHIP

Technical Field

[0001] The present invention relates to a navigation support system for a ship, and more particularly to a navigation support system for a ship favorable for use when docking or undocking the ship (hereinafter simply referred to as "docking/undocking") and the like.

Background Art

[0002] When docking/undocking a ship, docking/undocking work is carried out. For example, for a large vessel, side thrusters may be used, the hull may be moved by a tugboat, or the hull may be pulled toward the quay side using mooring lines.

[0003] An image system has been proposed in which cameras are provided on the ship, and during such docking/undocking work, a ship operator is able to look at an image indicating the positional relationship between the ship and the quay.

Prior Art Document

Patent Document

[0004] Patent Document 1: Japanese Patent Laid-Open No. 2010-41530

Summary of the Invention

Problems to be solved by the Invention

[0005] According to the image system, when docking/undocking and the like, the ship operator is able to operate the ship's propulsion device, steering gear, and side thrusters while looking at the image, while in

Note that, as illustrated in FIG. 2, respective imaging regions R1 to R10 of the cameras C1 to C10 cover the entirety of the region enclosed by the hull thick-frame, and are also set such that neighboring imaging regions of the cameras partially overlap each other.

[0044] Also, a draft detection unit 10 is provided on the upper edge on the left side in the approximate longitudinal center of the hull 4. The draft detection unit 10 includes a Doppler radar that detects the distance from the draft detection unit 10 to the water surface W and outputs a signal. Note that the draft detection unit 10 may also be a pressure-type detection unit that measures the pressure acting on the outer surface of the hull 4, and computes the draft of the hull on the basis of the measured pressure. Furthermore, the draft detection unit 10 may also be a detection unit that computes a draft value of the hull on the basis of the weight of the cargo loaded in the hull 4 and the amount of ballast water inside the ballast tanks of the hull 4.

[0045] As illustrated in FIG. 3, the cameras C1 to C10 are connected to a PoE hub 12 via LAN cables. Also connected to the PoE hub 12 is a processor 14 that has a function of compositing an integrated overhead view image including the hull 4 and the surroundings of the hull 4 on the basis of the image signals from the cameras C1 to C10, and outputting a signal expressing the overhead view image. In addition, nautical instruments 16, such as a GPS, a compass, a depth indicator, and a wind direction/speed gauge for example, as well as an engine information detection unit 18 that detects engine information such as the rudder angle, the rotation rate of the thrust shaft, and the rotation rate of stern thrusters/bow thrusters are connected to the PoE hub 12 via a communication converter