ABSTRACT

A hanging device for anchoring a marine hanging staging system includes a first end for receiving an anchor and defining an opening. The first end includes a threaded end. The threaded end attaches the first end to a first nut that includes a threaded opening for receiving the threaded end of the first end. A second opening in the first nut is included for receiving a coupling means such as a strap to couple the nut to a second nut. An insulated block of material is disposed between the first and second nuts. A second end is shaped similar to the first end and includes an opening for receiving a shackle or other such device for coupling the device to a wire rope that supports a plank that forms the marine hanging staging system.
INSULATED HANGER DEVICE

[0001] There are no related patent applications.

[0002] The subject matter of the present invention did not receive federal government research and development funding.

BACKGROUND OF THE INVENTION

[0003] The present invention generally relates to a device for suspending scaffolding comprising planking that supports workers, equipment and/or materials. More specifically, the invention relates to a suspended scaffolding system and device that comprises a first end for accepting an anchorage and a second end coupled to the first end and electrically isolated therefrom for attaching to an end of a cable or rope wire to support a planking therefrom. The present invention is useful in providing scaffolding that may be electrically isolated from a hull of a ship or other such structure to aid in marine construction, repairs and the like of the ship or structure.

[0004] Marine hanging staging (MHS) is a type of a tier, level or temporary elevated platform that supports workers, their tools and supplies. MHS is commonly used in shipyard operations to readily configure a support platform that may accommodate a variety of hull configurations and sizes. Typically, MHS is configured to be used by workers to perform abrasive blasting, welding and painting work on a hull surface of a vessel or other structure. The staging is typically rigged as paired assemblies of wire rope or suspension cables hung from overhead anchorages such as those known in the art as pork chop anchorages and s-hook anchorages. Rope walkers construct the MHS system by installing anchorage attachments and suspension cable assemblies in holes on an overhead structural steel support of a vessel or tank. Struts are attached to the pairs of wire rope at various heights to support planks that support workers, equipment and/or materials.

[0005] Failure of a MHS system is a major concern to ship repair workers. Should the MHS system fail, the workers may suffer from great distances resulting in injury or death. Previously, MHS systems have failed when the structural integrity of the wire ropes were compromised. One such failure occurred when a stray current from a welding machine passed through a wire rope. The diameter of the rope was unable to adequately pass the stray current to ground and the structural integrity was compromised causing the rope to be unable to support the load applied between the planking and the anchorage. A failure of the MHS system occurred resulting in injury to the workers.

[0006] The invention is aimed at providing a device for anchoring a MHS system to anchorage points while electrically isolating the system from the hull of the ship to prevent stray currents from passing through the wire rope which may result in structural failure of the wire rope and collapsing of at least a portion of the MHS system.

SUMMARY OF THE INVENTION

[0007] The hanging device includes a first end for accepting an end of an anchorage and a second end for accepting an end of the support cable or shackle attached thereto to provide support for a rope wire that attaches to a planking that is part of a MHS system. The first and second ends are coupled together via a coupling means that electrically isolates one end from the other.

[0008] In a first embodiment, an eye bolt having an opening and a threaded extension comprises a first end of the hanging device. The threaded extension passes through and is threaded into a threaded opening in a first eye nut. The first eye nut includes a second opening through which a coupling means passes to secure a second end to the first end. Typically, the coupling means is a nylon strap that has electrical isolative properties while having a tensile strength great enough to support a portion of the MHS. A block of insulator material is disposed between the first eye nut and a second eye nut coupled to a second eye bolt that comprises the second end. The nylon strap and block of insulator material serve as a coupling means between the first and second eye nuts.

[0009] Thus, the present invention comprises a hanging device that includes two ends that are coupled together. The ends are electrically isolated from one another to create a hanger that can couple the planks to an anchorage point without electrically coupling the planks and anchorage such that they may be maintained at electrical differences. That is to say the anchorage point and the MHS system may be electrically isolated from one another. Thus the hanging device acts as an insulator between the structure and suspension cable to prevent cable embrittlement caused by stray currents passing through the wire rope.

[0010] The size and shape of the hanging device lends itself to being readily used by rope walkers during the installation process of the MHS system. A plurality of hanging devices may be clipped onto a belt or rope and easily carried by a rope walker. Since the first and second ends are substantially similar in shape, the rope walker can readily deploy the hanging devices without concern for a proper orientation of the devices. When the rope walker reaches a desired location, a hanger may be readily deployed and secured at one end to an anchorage and at a second end to a rope wire that is coupled to a plank.

[0011] It is an object of the invention to provide a suspension cable assembly that comprises a hanger that electrically isolates a MHS system from a support structure. The hanger provides an electrical insulation between the hull of the vessel or structure upon which work is being performed and the MHS system to prevent electrical currents from passing through suspension cables.

[0012] It is a further object of the invention to provide a hanger that can be easily deployed and used to support a MHS system. In one instance, the hanger supports a load of over four thousand pounds.

[0013] It is a further object of the invention to provide a hanger that comprises a first end and a second end for receiving an anchorage and a support cable, respectively. The first and second ends are coupled to one another by a coupling means. The coupling means exhibits electrical insulative or isolative characteristics.

[0014] It is a further object of the invention to provide a hanger that is rugged and remains in tact and does not severely degrade during sandblasting and other necessary marine construction operations.

[0015] These and other objects of the invention will become apparent to those skilled in the art upon review of
the following drawings and appended claims. Additional objects and advantages of the invention will be set forth in part in the description which follows, and in part will be obvious from the description, or may be learned from practicing the invention. The objects and advantages of the invention will be obtained by means of instrumentalities in combinations particularly pointed out in the appended claims.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 shows a marine hanging staging system comprising an insulated staging hanger of the present invention.

FIG. 2 depicts a perspective view of the insulated staging hanger without a protective covering.

FIG. 3 is a perspective view of an insulated hanger with a protective covering.

FIG. 3A is a cross section view of FIG. 3.

FIG. 3B is a cross section view of a second embodiment of the invention.

FIG. 5 is a cross-section view of the protective covering shown in FIG. 4A.

DETAILED DESCRIPTION OF THE INVENTION

FIG. 1 depicts a MHS system for use with the present invention. The MHS system 101 includes planks 103 upon which workers walk. The planks 103 are supported by pairs of suspension cables 102 that attach to anchorage points (not shown). The hanger 1 attaches to an end of the cable opposite the plank 103 via a screw pin shackle or other such fastening device. A second end of the hanger 1 attaches to an anchor point via a second fastening device. Ladders 104 are provided between the planks 103 for traversing between the different levels of the MHS system 101.

FIG. 2 shows one embodiment of the invention. It is readily apparent to one of ordinary skill in the art that various other elements may be substituted for those mentioned to achieve the same or similar results. The discussed embodiment of the invention merely discloses the best mode for carrying out the invention.

In FIG. 2, the hanger 1 comprises a first eyebolt 3A defining a through hole 7A and having a threaded portion 5A. The threaded portion 5A, of the first eyebolt 3A, threads into an eye nut 9A that defines an eye nut opening 13A. One side of an insulator 15, such as a rubber block, is arranged against the first eyebolt 9A. A second side of the insulator 15 is disposed against a second eye nut 9B. A coupling means 17, such as a nylon strap, passes through the first and second eye nut openings 13A and 13B. The coupling means 17 must exhibit sufficient tensile strength to support a portion of the MHS system 101.

A second threaded portion 5B of a second eyebolt 3B is threaded into a portion of the second eye nut 9B. One of the through holes, 7A or 7B accepts a first fastening device, not shown, for attaching the hanger 1 to an end of a suspension cable 102; while the other through hole, 7A or 7B accepts a second fastening device to couple the hanger 1 to an anchorage point, not shown.

FIG. 3 depicts the hanger 1 of FIG. 2 with an outer coating 23 that may comprise a friction tape for protecting the coupling device 17 and the insulator 15 from damage created by sandblasting operations.

FIG. 4A shows the hanger 1 of FIG. 3 in cross section. In this embodiment, the hanger 1 includes three layers of material that comprise an outer protective coating. The outer protective coating is more clearly shown in FIG. 5. The outer protective coating includes an outer most layer of friction tape 23 that overlays a layer of rubber tape 21 which overlays a layer of glass insulation tape 19. The glass insulation tape 19 is wrapped around the eyebolts 9A and 9B, as well as the nylon strap 17 and rubber block 15. The

FIG. 6 depicts the hanger 1 of FIG. 2 with a first end having an opening for coupling the hanger device to an anchorage point.

FIG. 6A shows a second embodiment of the invention with a different outer coating 25. In this embodiment, the hanger 1 includes an outer coating 25 that has been deposited on a portion of the eyebolts 9A and 9B. The outer coating exhibits electrical isolative and friction protective characteristics. It may comprise a rubberized material that is soft at higher temperatures and hard at lower operating temperatures. It may also be impregnated with materials to increase its electrical isolative and friction resistant characteristics.

It is to be understood that the invention is not limited to the exact construction illustrated and described above, but that various changes and modifications may be made without departing from the spirit and the scope of the invention as defined in the following claims.

I claim:

1. A hanger device that couples a wire rope from planking that comprises hanging staging and an anchorage point, said hanger device providing support to workers on marine structures and comprising:

   a first end having an opening for coupling the hanger device to an anchorage point;

   a second end substantially similar in shape as the first end and having an opening for coupling the hanger device to the planking;

   said first and second ends being electrically isolated

2. The hanger device of claim 1 wherein said anchorage point is part of a marine structure.

3. The hanger device of claim 1 wherein said first end comprises an eyebolt coupled to an eye nut.

4. The hanger device of claim 3 wherein said second end comprises an eyebolt coupled to an eye nut.

5. The hanger device of claim 4 further comprising a nylon strap and a block of insulating material.

6. The hanger device of claim 1 further including an external coating that covers at least a portion of the first and second ends, said external coating comprising materials having electrical isolative and abrasive resistive qualities.

7. The hanger device of claim 6 wherein said external coating comprises a glass insulation tape, a rubber tape and a friction tape.

8. A hanger device that couples marine hanging staging to a marine structure, said hanger device comprising:

   a first end comprising a first eyebolt that includes a hole and a threaded portion;
a first eye nut having a hole and being coupled to said threaded portion of the first eyebolt via a threaded opening;
a second end comprising a second eyebolt that includes a hole and a threaded portion;
a second eye nut having a hole and coupled to said threaded portion of the second eyebolt via a threaded opening; and
a block of insulative material disposed between the first and second eye nut.

9. The hanger device of claim 8 that further includes a nylon strap passing through both the first and second eye nuts to couple the first and second ends together.

10. The hanger device of claim 8 wherein said block of insulative material comprises rubber.

11. The hanger device of claim 8 further including an exterior covering disposed on at least a portion of the first and second eye nuts.

12. The hanger device of claim 11 wherein said exterior covering consists of one or more selected from a group consisting of rubber tape, friction tape and glass insulation tape.

13. A hanger device that couples a marine staging hanging system to an anchorage point on a marine structure comprising:
a first end means including a hole for coupling the hanger device to the anchorage point;
a second end means including a hole for coupling the hanger device to the marine hanging system;
a coupling means that couples the first end means to the second end means, said coupling means electrically isolating the first end means from the second end means.

14. The hanger device of claim 13 wherein said first end means comprises an eyebolt.

15. The hanger device of claim 13 wherein said first end means comprises an eye nut.

16. The hanger device of claim 13 wherein said coupling means includes a nylon strap.

17. The hanger device of claim 13 further including an exterior coating means having electrical isolative and friction resistive characteristics.

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